

## **9-9 Tactical Trucks**

**ITEM:** M1114 & M1151 Up-Armored HMMWV's

**SUBJECT:** Picatinny Objective Gunner Protection Kit (O-GPK) with BPMTU and Manual Traversing Unit Installation Document.

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**COMMENTS:** A procedure has been developed to install picatinny objective gunner protection kit (O-GPK) with BPMTU and manual traversing unit on the Up-Armored M1114 and M1151.

**LIST OF EFFECTIVE PAGES**

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FOLLOWING:**

Page No. ....\*Change No.

A .....	1
1-21 .....	1
22-30 .....	0
31 .....	1
32-35 .....	0
36 .....	1
37-39 .....	0
40 .....	1
41-43 .....	0
A1-A2 .....	1

\*Zero in this column indicates original page.

## MATERIALS/PARTS

NSN (PART NUMBER)	NOMENCLATURE	QTY
(13014371)	Objective Gunner Protection Kit	1
Consisting of		
(13014396)	EIR Digest Article, O-GPK Installation	1
(13014372)	Armor Panel, Right	1
(13014373)	Armor Panel, Left	1
(13014374)	Armor Panel, Rear	1
(13014375)	Bracket, Rear Corner	2
(13014376)	Plate, Base, M1114	1
(13014377)	Sleeve, Bearing	1
(13014378)	Panel, Front	1
(13014379)	Bracket, Left Front, Outer, M1151	1
(13014380)	Bracket, Left Front, M1114	1
(13014381)	Bracket, Point	1
(13014382)	Plate, Seam	2
(13014383)	Plate, Base, M1151	2
(13014384)	Window, Large	5
(13014388)	Bracket, Side	2
(13014389)	Bracket, Right Front	1
(13014390)	Window, Front Right	1
(13014393)	Window, Front Left	1
(13014395)	Spacer, Shield, Angled	1
(13014397)	Spacer, Shield, Vertical	1
(13014398)	Window Bracket Assembly, Short	10
(13014399)	Window Bracket Assembly, Long	10
(13014402)	Handle	2
(13014403)	Grommet, Rubber	1
(13014404)	Cover, Wire	1
(13014405)	M4 Bracket, Rear	1
(13014411)	Window, Bracket Assembly, Top	2
(13014412)	Window, Bracket Assembly, Bottom	2
(13014413)	Seat	1
(13015487)	Seat Bracket	2
(13014414)	Plate, Data	1
(57K3214)	Parts Kit, Mirror Assembly, Rearview	1
(13014420)	Shield, Front	1
(13014416)	M4 Bracket, Front, Assembly	1
Consisting of		
(12367450)	Clip, Spring Tension	1
(13014415)	M4 Bracket, Front	1
(91251A382)	Screw, Socket Head, .312-24 X .875	2
(B1821BH038C100N)	Screw, Hex Head .375-16 X 1.000	1
(MS51943-35)	Nut, Self Locking .375-16	

<b>NSN (PART NUMBER)</b>	<b>NOMENCLATURE</b>	<b>QTY</b>
(13014406)	Hatch Bracket Kit	1
Consisting of		
(6435492-01M1) Green 383 or (6435492-200M1) Tan 686A	Hatch Bracket Kit	1
Consisting of		
(6431637-01M1) Green 383 or (6431637-200M1) Tan 686A	Hatch Mounting Bracket	1
(6431753-01M1) Green 383 or (6431753-200M1) Tan 686A	Hatch Mounting Bracket Screws	5
(4397064-005)	Nut, Locking .375-16	5
(4397005-014)	Washer, Flat .375 SAE	5
(6431616-01M1) Green 383 or (6431616-200M1) Tan 686A	Left Hand Rear Support Bracket	1
(6431617-01M1) Green 383 or (6431617-200M1) Tan 686A	Right Hand Rear Support Bracket	1
(4397000-064)	Screw, Cap Hex Hd, .375-16 X 1.500	6
(4397000-062)	Screw, Cap Hex Hd, .375-16 X 1.250	10
(4397004-008)	Washer, Lock .375	18
(4397005-015)	Washer, Flat 3/8 USS	20
(6431611-01M1) Green 383 or (6431611-200M1) Tan 686A	Small Mounting Angle Bracket	4
(4397000-060)	Screw, Cap Hex Hd, .375-16 X 1.000	4
(13014407)	Pintle Adapter Kit	1
Consisting of		
(6435493-01M1)	Pintle Adapter Kit	1
Consisting of		
(12484847)	Pintle Adapter	1
(12012067)	Clamping Pawl	1
(12012071)	Split Sleeve	1
(5140237)	Screw	1
(12012065)	Locking Handle Assembly	1
(12484861-055)	Screw	4
(9421888)	Washer	4
(12484862-008)	Lockwasher	4
(12484864-005)	Nut	4
(12484848)	Pintle Lock	1
(12484863-005)	Pintle Lock Screw	2
(12484862-006)	Pintle Lock Lockwasher	2

<b>NSN (PART NUMBER)</b>	<b>NOMENCLATURE</b>	<b>QTY</b>
(13014408)	Manual Traversing Gear Kit	1
Consisting of		
(6435129-01M1)	Kit, Manual Traversing Unit Installation	1
Consisting of:		
(6434946-01M1)	Assembly, Traversing Gear	1
5340-01-535-5705 (4662414-002)	Cover, Traversing Unit-Upper	1
(4662418-002)	Cover, Traversing Unit-Lower	1
5340-01-535-5708 (4662416-002)	Bracket, Traversing Unit Cover-Front	1
(6435128-01M1)	Pouch, Release Handle	1
(6431468-05M1)	Velcro Hook with PSA Backing	33 in.
(6435130-01M1)	EIR Digest Article, Manual Traversing Unit Installation Kit-Installation Instructions	1
(6435131-01M1)	Kit, Hardware-Traversing Unit	1
Consisting of:		
5310-01-439-8177 (4397064-005)	Nut, Hex Locking, .375-16	2
5310-01-419-2413 (4397005-014)	Washer, Flat, .375 SAE	3
5305-01-513-5711 (4397054-032)	Screw, Thread Forming, Pan Hd Phillips, #10 X .625	5
5305-01-513-5667 (4397000-059)	Screw, Cap Hex Hd, .375-16 X .875	2
5305-01-535-5632 (4397030-120)	Screw, Cap Socket Hd, .375-24 X .875	1
5306-01-433-9180 (4397000-005)	Screw, Cap Hex Hd, .250-20 X .625	4
5310-01-435-7784 (4397005-010)	Washer, Flat, .250 SAE	4
(13014409)	BPMTU Kit	1
Consisting of		
(6435433-01M1) Green 383 or (6435433-200M1) Tan 686A	Kit, Field Installation – Battery Powered Motorized Traversing Unit	1
Consisting of		
(6435456-01M1)	EIR Digest Article, Installation Instructions	1
(6432544-01M1)	Template, Fuse Locator	1
(6435451-01M1) Green 383 or (6435451-200M1) Tan 686A	Assembly, Battery Box	1
(6432525-01M1)	Fuse, 60 Amp Waterproof	2

<b>NSN (PART NUMBER)</b>	<b>NOMENCLATURE</b>	<b>QTY</b>
(6433432-01M1)	Electrical Cable Set	1
Consisting of		
(6432531-01M1)	Wire Harness #2 Control Box to Ext. Battery Box	1
(6432535-01M1)	Wire Harness #3 Control Box to Joystick	1
(6432538-01M1)	Wire Harness #6 Fuse to Break Away Connector	1
(6432541-01M1)	Cable Assembly, Inside 24V DC Buss to Fuse	1
(6432542-01M1)	Assembly, Cable – Fuse to Aux Battery 2 Negative	1
(6432543-01M1)	Assembly, Cable – Fuse to Aux Battery 1 Positive	1
(6435382-01M1)	Wire Harness #7 Pigtail to Break Away Connector	1
(6435049-01M1)	Assembly, Battery	2
Consisting of		
(6432526-01M1)	Battery, 12 Volt – Gel Mat	1
(6432546-01M1)	Bolt, Battery Terminal	2
(6432501-01M1)	Lock, Drive Mount	1
(6433255-01M1)	Assembly, Motor and Drive	1
(6432530-01M1)	Box, Control – System Assembly	1
(6432878-01M1)	Seal, Night Vision Cover Plate	1
(6432502-01M1) Green 383 or (6432502-200M1) Tan 686A	Plate, Night Vision Cover	1
(1000049-003)	Trim, Edge	1.75 In.
(6432788-01M1)	Clamp, Loop	12
(6432528-01M1) Green 383 or (6432528-200M1) Tan 686A	Assembly, Joystick	1
(6435123-01M1)	Seal, Control Box – BPMTU, Inside	1
(6435453-01M1) Green 383 or (6435453-200M1) Tan 686A	Lid Assembly, Battery Box	1
(6432862-01M1) Green 383 or (6432862-200M1) Tan 686A	Strap Assembly, Battery Hold - Down	1
(6437073-01M1)	Guard, Drive Housing	1
(6432885-01M1)	Tie, Cable	5
(6432512-01M1)	Hardware Kit, Battery Powered Motorized Traversing Unit	1
Consisting of		
5310-01-439-8177 (4397064-005)	Nut, Lock .375-16	10
5310-01-521-2135 (4397050-025)	Nut, Upset Type, .250-20	1
5310-01-417-7273 (4397004-008)	Washer, Lock .375	10
(4397013-076)	Screw, Machine Pan Hd, #10-32 x 1.00	2

<b>NSN (PART NUMBER)</b>	<b>NOMENCLATURE</b>	<b>QTY</b>
5310-01-434-1385 (4397004-005)	Washer, Lock #10	4
5310-01-417-7333 (4397005-008)	Washer, #10	4
5310-01-435-7784 (4397005-010)	Washer, .250	12
5306-01-430-7399 (4397000-006)	Screw, Cap Hex Hd, .250-20 x .750	3
5310-01-433-0941 (4397004-006)	Washer, Lock .250	10
(6432884-01M1)	Bolt, Tap Hex Hd .375-16 x 2.00	4
5310-01-419-2413 (4397005-014)	Washer .375	6
5310-01-437-3845 (4397064-006)	Nut, Lock .375-24	2
5305-01-434-0831 (4397013-074)	Screw, Machine Pan Hd, #10-32 x .750	2
5310-01-439-8173 (4397064-001)	Nut, Lock .250-20	2
5306-01-433-9197 (4397000-062)	Screw, Cap Hex Hd .375-16 x 1.25	1
5310-01-439-8172 (4397064-003)	Nut, Lock .312-18	1
5310-01-422-9287 (4397005-012)	Washer .312	2
5305-01-420-6637 (4397000-034)	Screw, Cap Hex Hd .312-18 x 1.00	1
5306-01-433-9181 (4397000-007)	Screw, Cap Hex Hd .250-20 x .875	4
5306-01-433-9180 (4397000-005)	Screw, Cap Hex Hd .250-20 x .625	3
(6430529-06M1)	Nut, Hex .375-16	4
(4397000-067)	Screw, Hex Head .375-16 x 2.25	4
(13014410)	O-GPK Fasteners	1
Consisting of		
(92620A628) alt: (RIA151217-150)	Screw, Hex Head (.375-16 UNC x 1.50)	28
(92620A632)	Screw, Hex Head (.375-16 UNC x 2.00)	3
(NASM35338-46) alt: (RIA151215-375)	Washer, Locking (.375 NOM)	48
(MS27183-14)	Washer, Flat (.375 NOM)	72
(MS51943-35)	Nut, Self-Locking (.375-16 UNC)	40

(B1821BH031C063N) alt: (RIA151219)	Screw, Hex Head (.312-18 UNC 0.625 LG)	60
(NASM35338-45) alt: (RIA151215-312)	Washer, Locking (.312 NOM)	64
(B1821BH038C063N)	Screw, Hex Head (.312-16 UNC 0.625 LG)	12



NSN (PART NUMBER)	NOMENCLATURE	QTY
(B1821BH038C350N)	Screw, Hex Head (.375-16 UNC 3.50 LG)	1
(91253A357)	Screw, Flat Socket Head (.375-24 UNF x 1.25)	4
(9428747)	Screw, Set (.375-24 UNF x 1.00)	4
(92620A716)	Screw, Hex Head (.500-13 UNC x 1.50)	6
(92620A720)	Screw, Hex Head (.500-13 UNC x 2.00)	6
(MS51943-39)	Nut, Self-Locking (.500-13 UNC)	12
(NASM35338-48) alt: (RIA151215-500)	Washer, Locking (.500 NOM)	12
(MS27183-19)	Washer, Flat (.500 NOM)	24
(92620A587)	Screw, Hex Head (.312-18 UNC 1.50 LG)	4
(MS51943-33)	Nut, Self-Locking (.312-18 UNC)	4
(MS27183-12)	Washer, Flat (.312 NOM)	8
(B1821BH038C125N)	Screw, Hex Head (.375-16 UNC x 1.25)	2
LOCTITE 222	Threadlocker, Low Strength	1

## Section 1: Picatinny Objective Gunner Protection Kit (O-GPK) Installation

### PROCEDURES:

A. Installation of the Picatinny Objective Gunner Protection Kit (O-GPK):

### **WARNING**

SOME COMPONENTS OF THE O-GPK ARE HEAVY AND REQUIRE TWO-MAN LIFT SO PERSONNEL INJURY DOES NOT OCCUR.

1. Remove any existing system from roof of vehicle.

### **NOTE**

Due to different lengths in bolts, Ensure hardware is inserted in same hole from which it came from.

- a. Use existing four bolts, eight washers and four MS51943-35 locknut to secure pintle to turret ring. Tighten bolts to 37 lb-ft (50 N·m).
- b. Use existing bolts and washers to fill holes from the existing GPK mounting brackets into the turret. Tighten bolts to 37 lb-ft (50 N·m).

2. Assemble hatch cradle/base plate assembly as follows:

- a. Attach 6431611 small mounting angle brackets (1) to 6431616 left rear support bracket (6) and 6431617 right rear support bracket (2) using two 4397000-060 hex bolts (3), two 4397004-008 lockwashers (4) and three 4397005-015 washers (5) as shown in figure 1. Do not tighten hex bolts at this time.

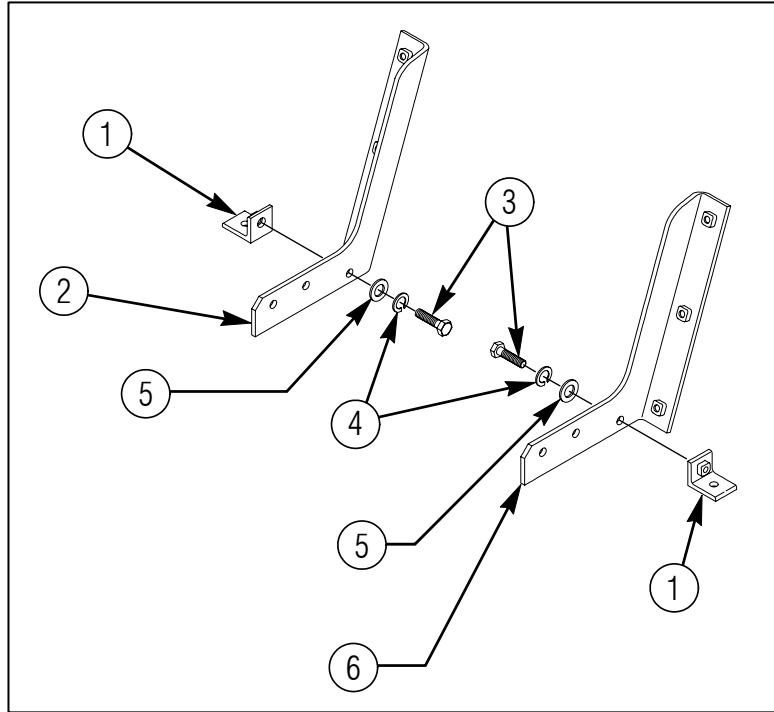


Figure 1

- b. Attach left rear support bracket assembly (6) and right rear support bracket assembly (2) to 6431637 hatch mounting bracket (7) using four 4397000-062 hex bolts (8), four 4397004-008 lockwashers (9) and four 4397005-015 washers (10) as shown in figure 2. Do not tighten hex bolts at this time.

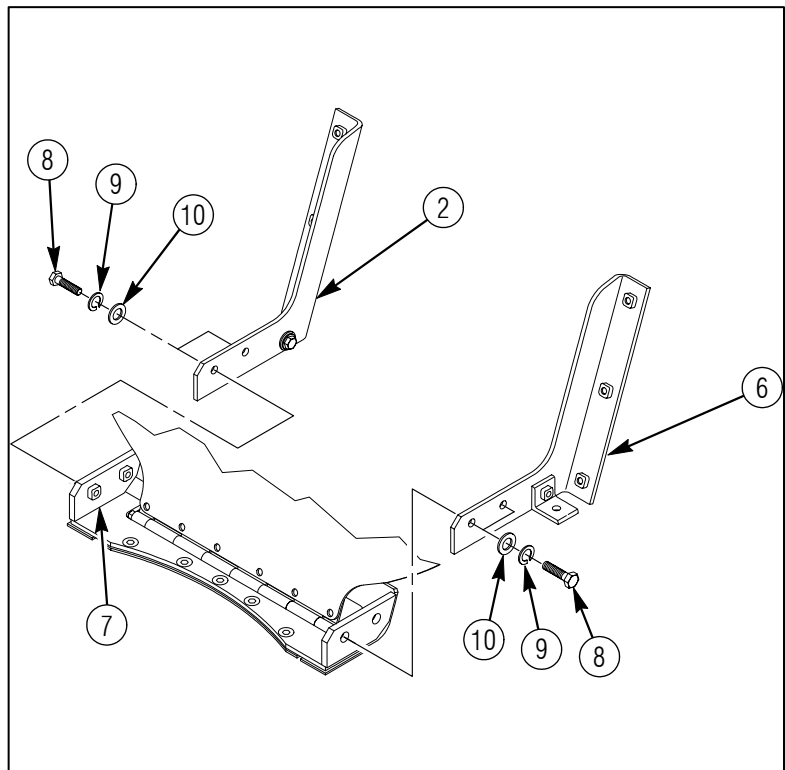
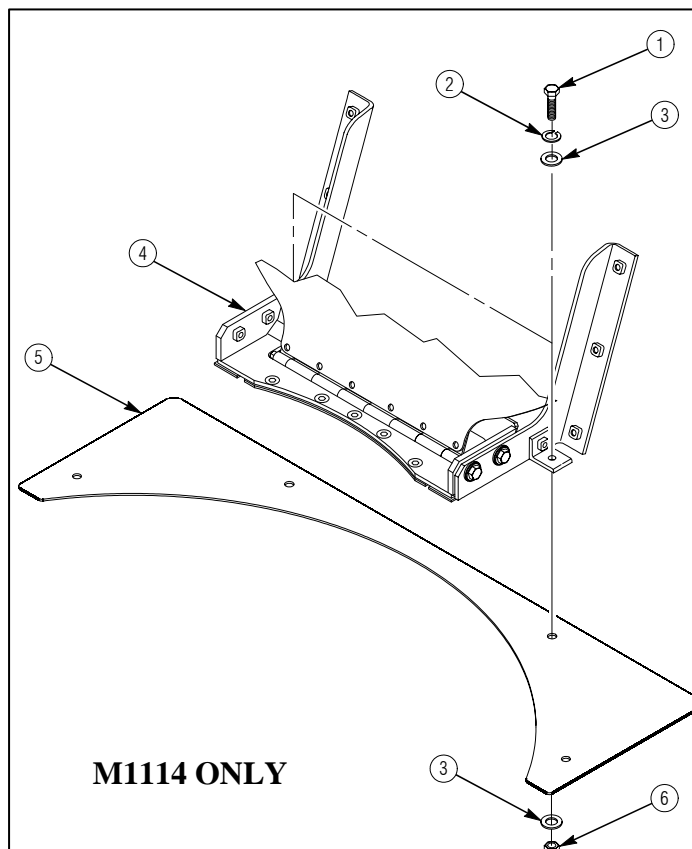
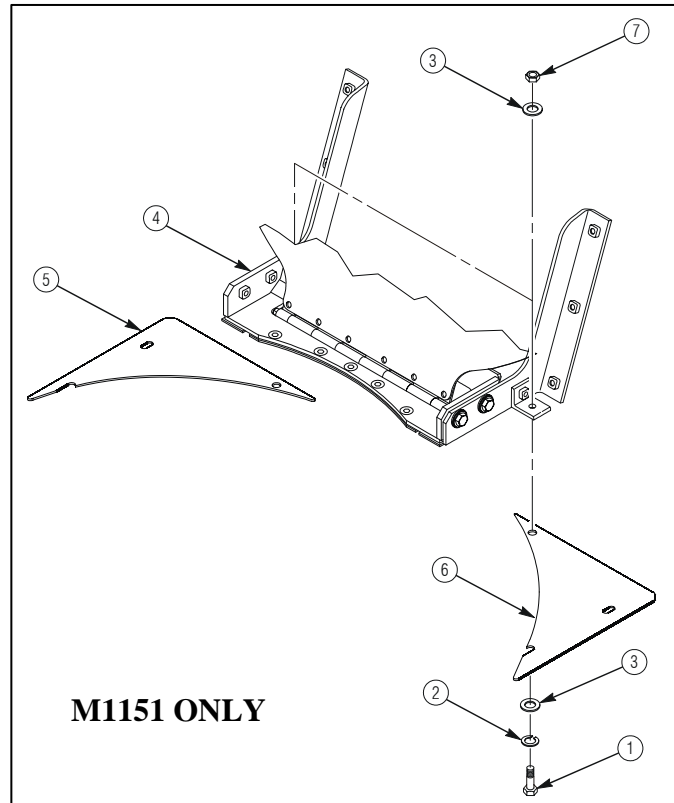


Figure 2

- c. For M1114 only, attach hatch cradle assembly (4) to 13014376 rear base plates (5), (6) using six 4397000-062 hex bolts (1), six NASM35338-46 lockwashers (2), twelve MS27183-14 washers (3) and six MS51943-35 locknuts (7) as shown in figure 3.

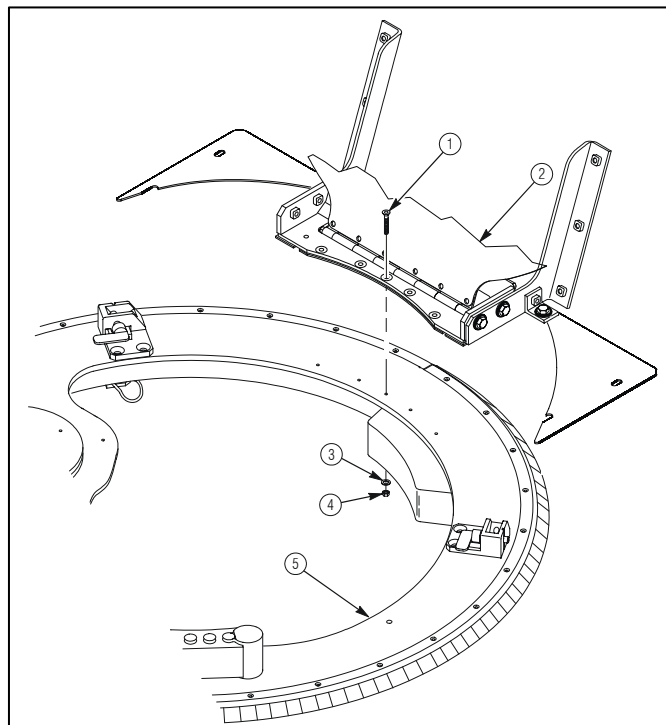


- d. For M1151 only, attach hatch cradle assembly (4) to 13014376 rear base plates (5), (6) using six 4397000-062 hex bolts (1), six NASM35338-46 lockwashers (2), twelve MS27183-14 washers (3) and six MS51943-35 locknuts (7) as shown in figure 3.
- e. Tighten hex bolts (3) to 37 lb-ft (50 N·m) as shown in figure 1 (pg 7).
- f. Tighten hex bolts (8) to 37 lb-ft (50 N·m) as shown in figure 2 (pg 7).
- g. Tighten hex bolts (1) to 37 lb-ft (50 N·m) as shown in figure 3.



*Figure 3*

3. Attach hatch cradle/base plate assembly (2) to top of turret ring (5). Secure using five 6431753 countersink bolts (1), five 4397005-014 washers (3) and five 4397064-005 locknuts (4) as shown in figure 4. Tighten five countersink bolts (1) to 37 lb-ft (50 N·m).

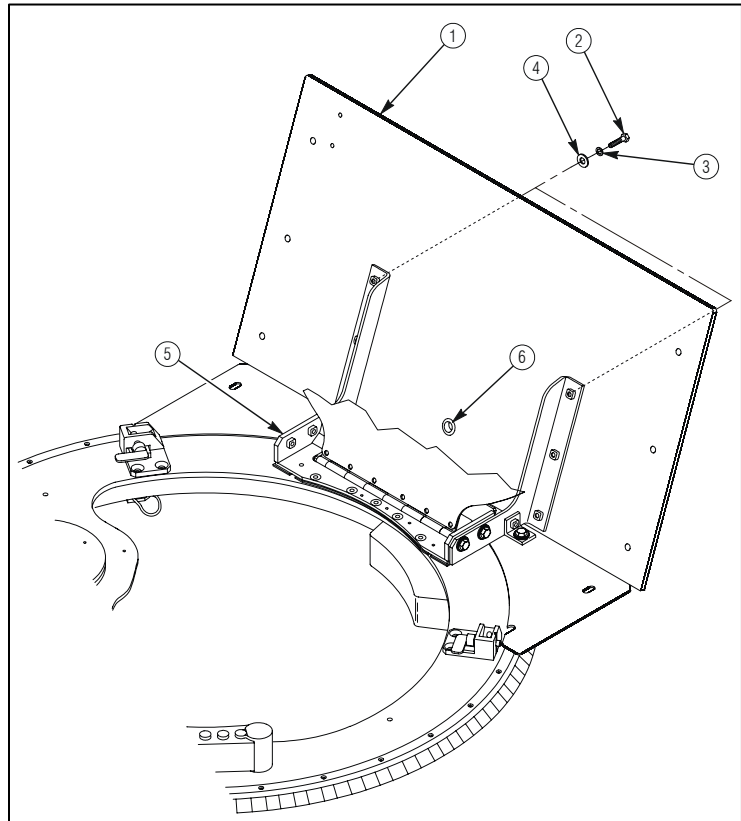


*Figure 4*

4. Attach 13014374 rear armor panel (1) to holes in the hatch cradle assembly (5) using six 4397000-064 hex bolts (2), six 4397004-008 lockwashers (3) and six 4397005-015 washers (4) as shown in figure 5.

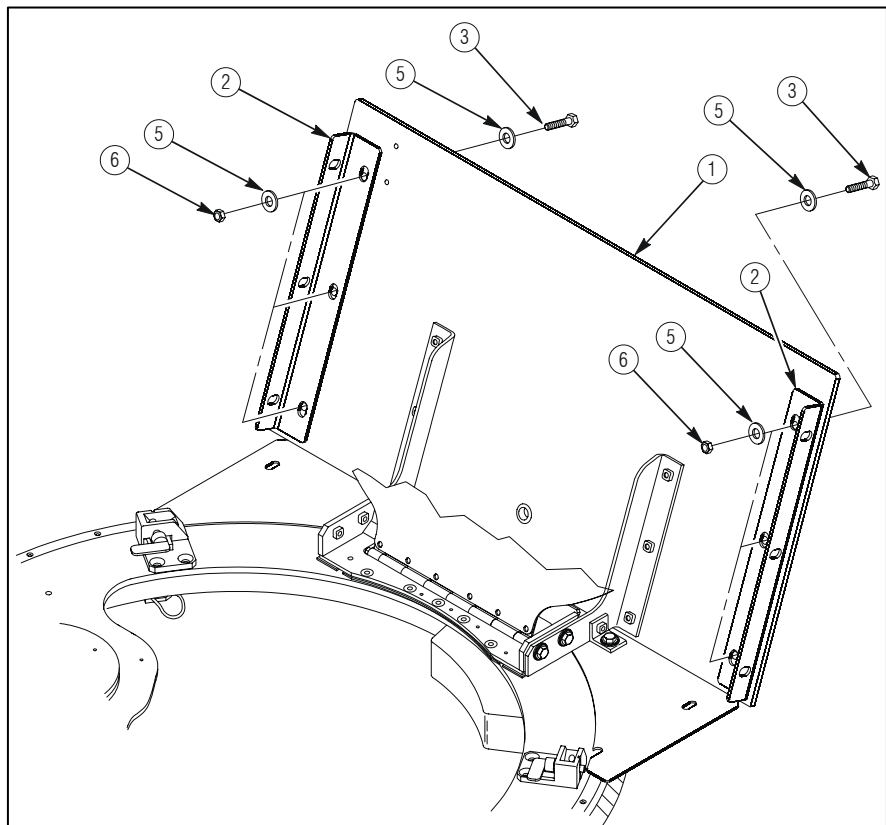
Tighten top two hex bolts (2) to 37 lb-ft (50 N·m). Leave remaining four hex bolts loose.

5. Insert 13014403 rubber grommet (6) into large hole on the lower portion of the rear armor panel (1) as shown in figure 5.



*Figure 5*

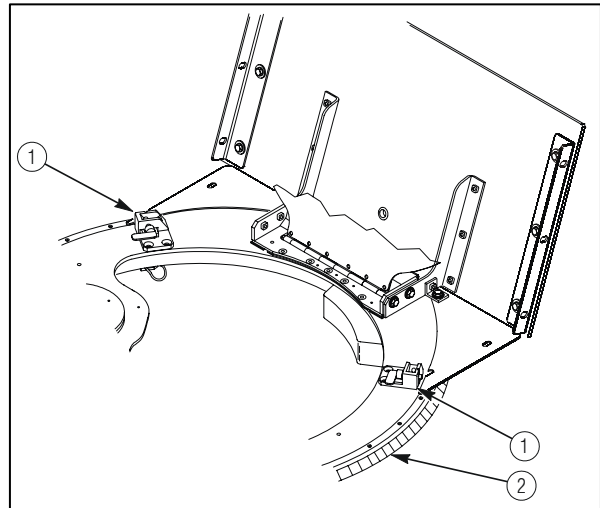
6. Attach 13014375 rear corner brackets (2) with vertical slots against rear armor panel (1) to sides of rear armor panel (1) using six 92620A716 hex bolts (3), twelve MS27183-19 washers (5) and six MS51943-39 locknuts (6) as shown in figure 6. Do not tighten hex bolts at this time.



*Figure 6*

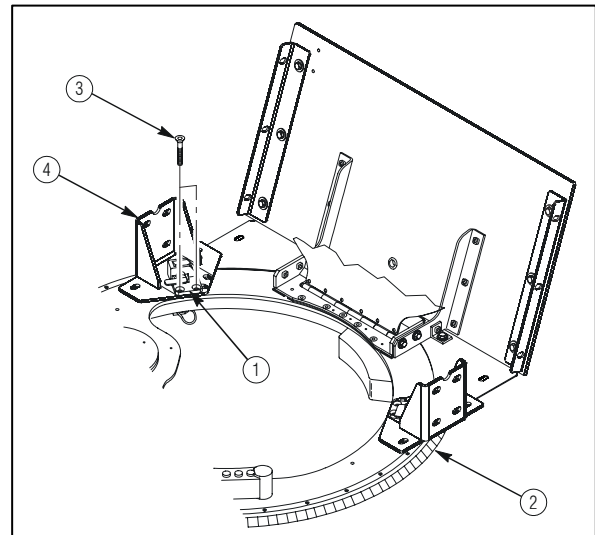
7. Attach side brackets as follows:

- a. Remove two hatch locks (1) from turret ring (2) as shown in figure 7.



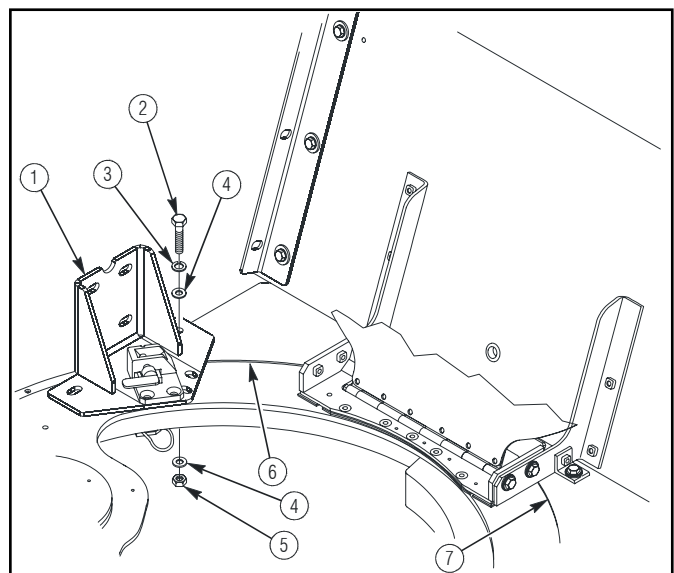
*Figure 7*

- b. Apply sealing compound to threads of four 91253A357 countersink bolts (3).
- c. Attach existing hatch locks (1) and 13014388 side brackets (4) to turret ring (2) using four 91253A357 countersink bolts (3) as shown in figure 8. Do not tighten countersink bolts (3) at this time.



*Figure 8*

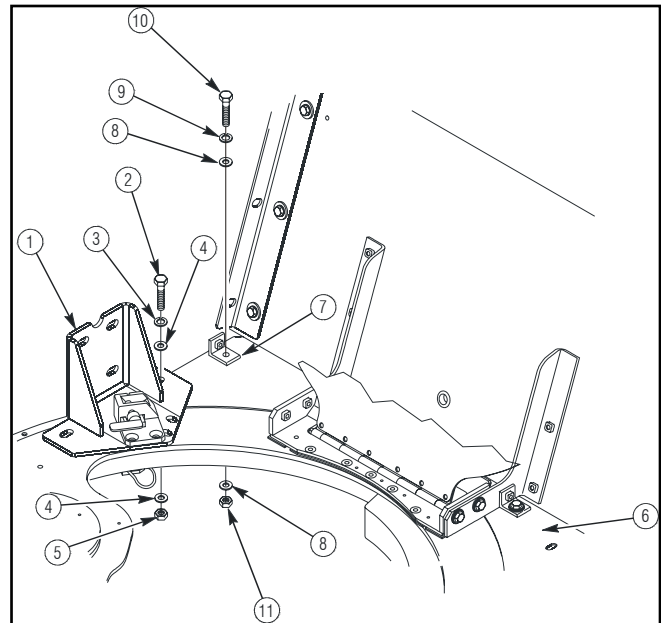
- d. For M1114 only, secure two side brackets (1) to base plate (6) using two B1821BH038C100N hex bolts (2), two NASM35338-46 lockwashers (3), four MS27183-14 washers (4) and two MS51943-35 locknuts (5) as shown in figure 9. Do not tighten hex bolts at this time.



*Figure 9*

- e. For M1151 only, secure side brackets (1) to base plate (6) using two (one each side) B1821BH038C100N hex bolts (2), two NASM35338-46 lockwashers (3), four MS27183-14 washers (4) and two MS51943-35 locknuts (5) as shown in figure 9. Do not tighten hex bolts at this time.

- f. For M1151 only, secure 6431611 small angle brackets (7) to base plate (6) using two 4397000-060 capscrew (10), two NASM35338-46 lockwashers (9), four MS27183-14 flat washers (8) and two MS 51943-35 locknuts (11) as shown in figure 9.1. Do not tighten capscrews at this time.



*Figure 9.1*

- g. Tighten four countersink bolts (3) to 21 lb-ft (28 N·m). Refer to figure 8.

8. Remove hex bolt from top of TOW cover as shown in figure 10.
9. Attach 13014389 right front bracket (1) to top of TOW cover (5) using one B1821BH038C350N hex bolt (2), two MS27183-14 washers (3) and MS51943-35 locknut (4) as shown in figure 10. Do not tighten hex bolts at this time
10. Remove front combat hatch lock on inside of vehicle.

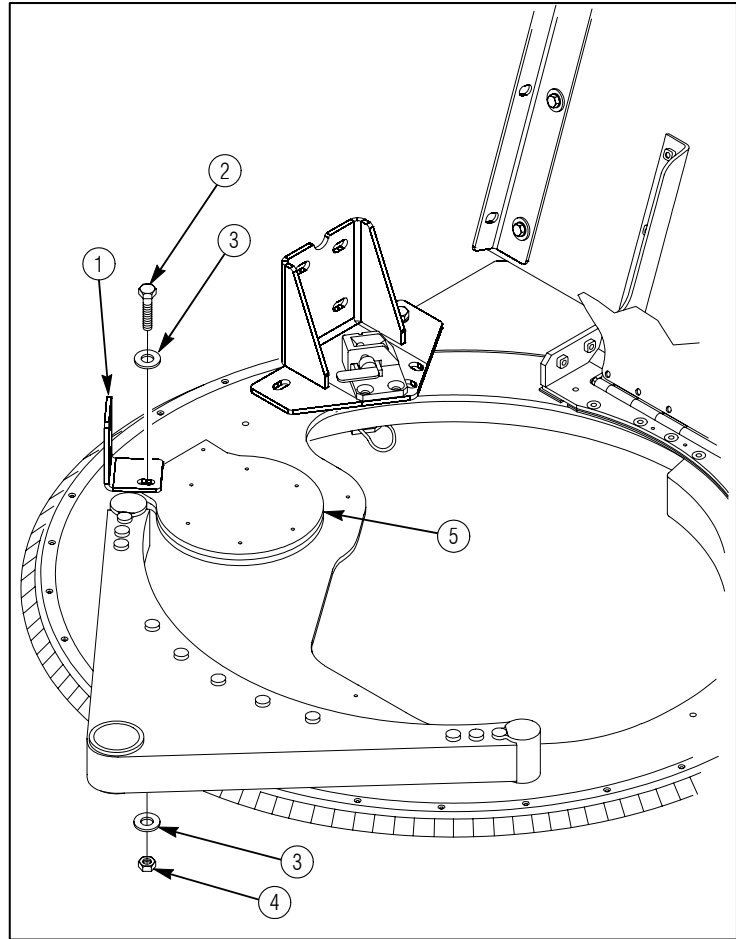


Figure 10

11. Apply sealing compound to threads of 92629A632 hex bolt (1).
12. For M1114 only, attach 13014380 left front bracket (4) and combat hatch lock to turret (5) using 92629A632 hex bolt (1), MS27183-14 washers (2) as shown in figure 11. Do not tighten hex bolt at this time.

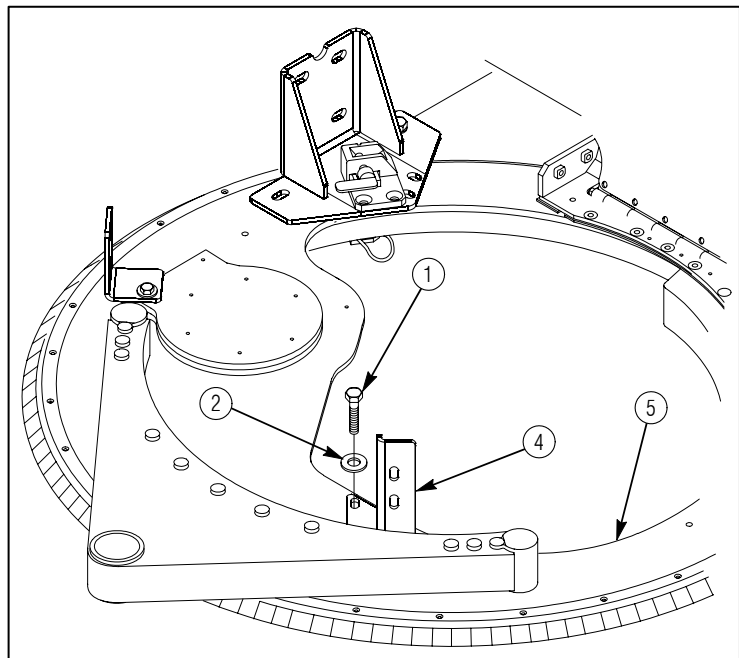


Figure 11



13. Install right armor panel as follows:

- a. Attach center of 13014372 right armor panel (5) to side bracket (12) using four 92620A628 hex bolts (8), four NASM35338-46 lockwashers (9), eight MS27183-14 washers (10) and four MS51943-35 locknuts (11) as shown in figure 12. Do not tighten hex bolts at this time.

- b. Attach 13014382 seam plate (4) and rear of right armor panel (5) to rear corner bracket (6) using three 92620A720 hex bolts (1), three NASM35338-48 lockwashers (2), six MS27183-19 washers (3) and three MS51943-39 locknuts (7) as shown in figure 12. Do not tighten hex bolts at this time.

- c. For M1114 only, fill hole (1) on left armor panel (2) using 92620A628 hex bolt (5), 4397004-008 lockwasher (4), two 4397005-015 flat washers (3) and 4397064-005 locknut (6) as shown in figure 12.1. Tighten hex bolt to 37 lb-ft (50 N·m).
- d. For M1151 only, attach small angle bracket (23) to right armor panel (5) using 92620A628 hex bolt (20), 4397004-008 lockwasher (21) and 4397005-015 flat washer (22) as shown in figure 12. Do not tighten capscrew at this time.
- e. Remove existing hex bolts (19), washers and nuts from top of TOW cover as shown in figure 12.

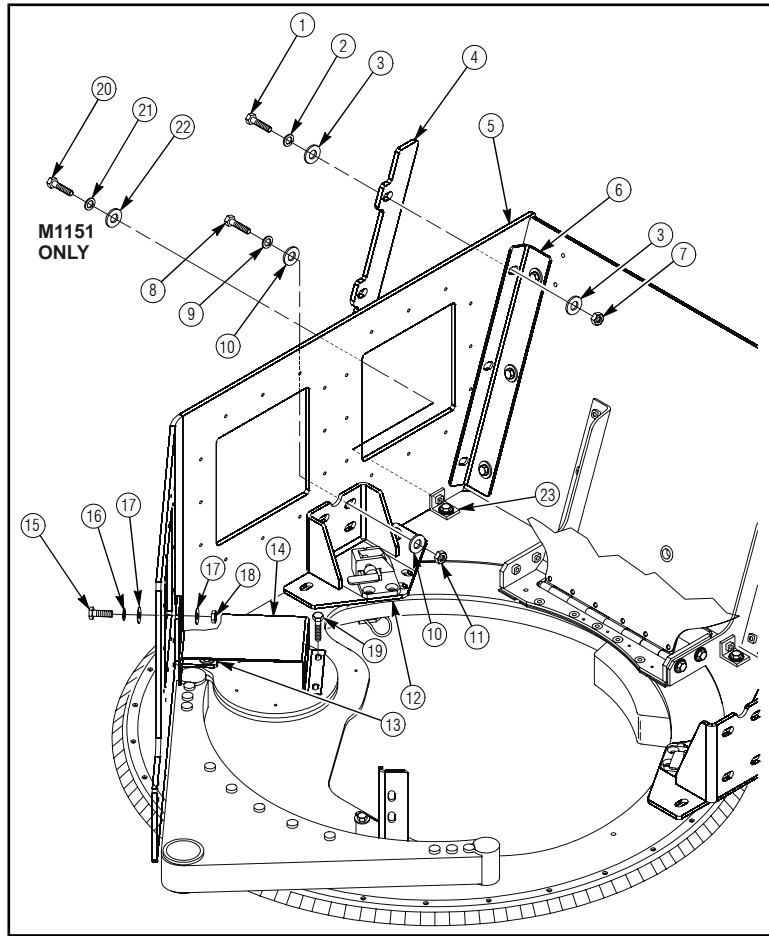
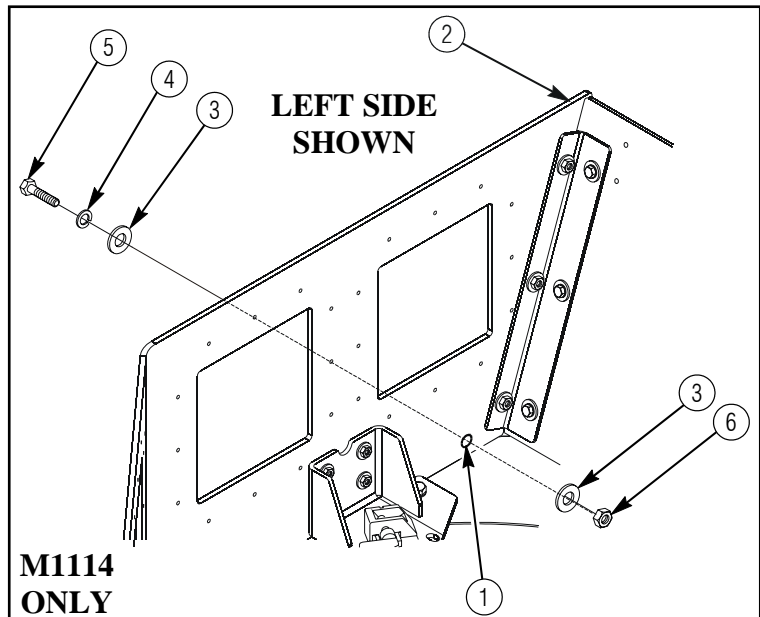


Figure 12

- f. Attach front of right armor panel (5) and 13014404 wire cover (14) to right front bracket (13) using two 92620A628 hex bolts (15), two NASM35338-46 lockwashers (16), four MS27183-14 washers (17) and two MS51943-35 locknuts (18) as shown in figure 12. Do not tighten hex bolts at this time



*Figure 12.1*

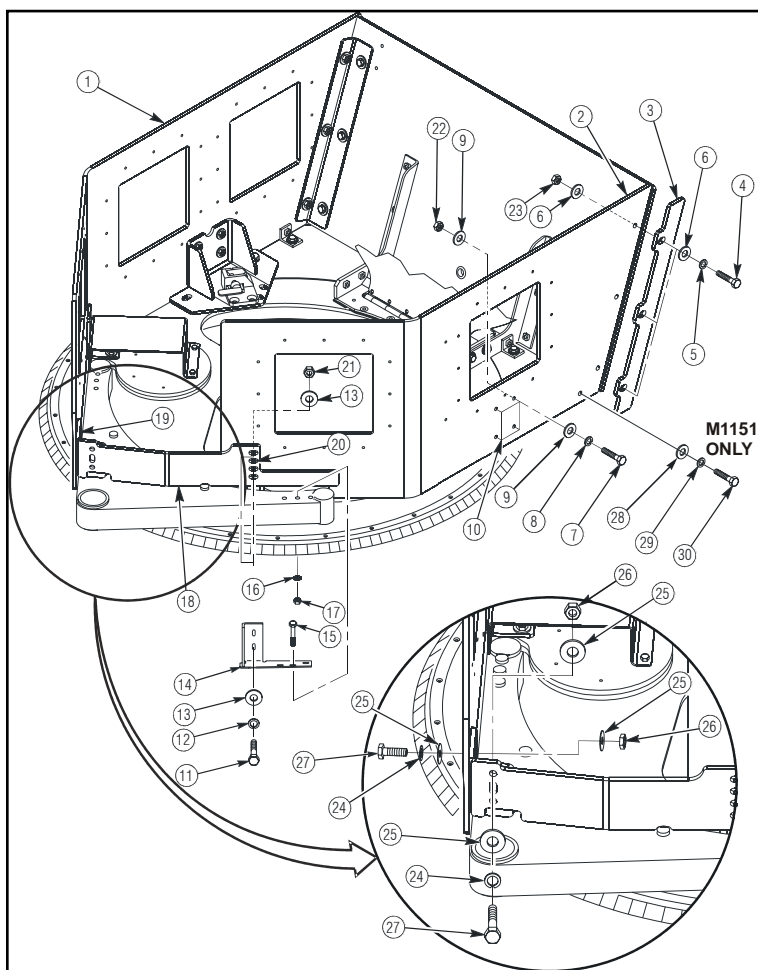
- g. Use existing hardware (19) to attach wire cover to turret access cover as shown in figure 12. Do not tighten hex bolts at this time.

14. Install left armor panel as follows:

### **NOTE**

Ensure left armor panel does not interfere with hatch when hatch is closed.

- a. Attach center of 13014373 left armor panel (2) to side bracket holes (10) using four 92620A628 hex bolts (7), four NASM35338-46 lockwashers (8), eight MS27183-14 washers (9) and four MS51943-35 locknuts (22) as shown in figure 13. Do not tighten hex bolts at this time.
- b. Attach 13014382 seam plate (3) to rear of left armor panel (2) using three 92620A720 hex bolts (4), three NASM35338-48 lockwashers (5), six MS27183-19 washers (6) and three MS51943-39 locknuts (23) as shown in figure 13. Do not tighten hex bolts at this time.
- c. For M1151 only, attach front of left armor panel (2), 13014378 front panel (18) and 13014379 left front outer bracket (14) to left front bracket holes (20) using two 92620A632 hex bolts (11), two NASM35338-46 lockwashers (12), four MS27183-14 washers (13), two MS51943-35 locknuts (21), three 4397001-067 hex bolts (15), three 4397005-014 washers (16) and ? three hex nuts (17) as shown in figure 13. Do not tighten hex bolts at this time.
- d. Attach 13014381 point bracket (19) to front panel (18) and right armor panel (1) using four 92620A628 hex bolts (27), four NASM35338-46 lockwashers (24), eight MS27183-14 washers (25) and four MS51943-35 locknuts (26) as shown in figure 13. Do not tighten hex bolts at this time.



*Figure 13*

- e. For M1114 only, fill hole (1) on right armor panel using 92620A628 hex bolt, 4397004-008 lockwasher, two 4397005-015 flat washers and 4397064-005 lock nut. Refer to figure 12.1. Tighten hex bolt to 37 lb-ft (50 N·m).

- f. For M1151 only, attach small angle bracket to left armor panel (2) using 4397000-062 capscrew (30), 4397004-008 lockwasher (29) and 4397005-015 flat washer (28) as shown in figure 13. Tighten capscrew (30) to 37 lb-ft (50 N·m).

- g. At this time tighten all .375 hex bolts to 37 lb-ft (50 N·m). Tighten all .500 hex bolts to 90 lb-ft (122 N·m).

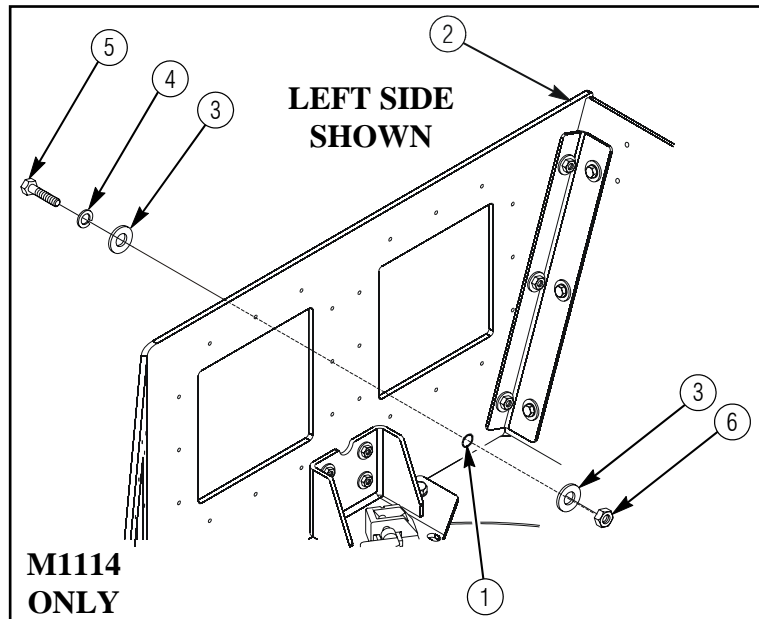


Figure 13.1

15. Install front shield as follows:

- a. Insert 13014377 bearing sleeve (2) into bearing sleeve hole (4) on turret and secure with locking pin (3) as shown in figure 14.
- b. Assemble pintle adapter kit (1) by installing 12012067 clamping pawl (2) into 12484847 pintle adapter (1) and ensure angled end of clamping pawl (2) matches contour of pintle adapter (1) as shown in figure 15.

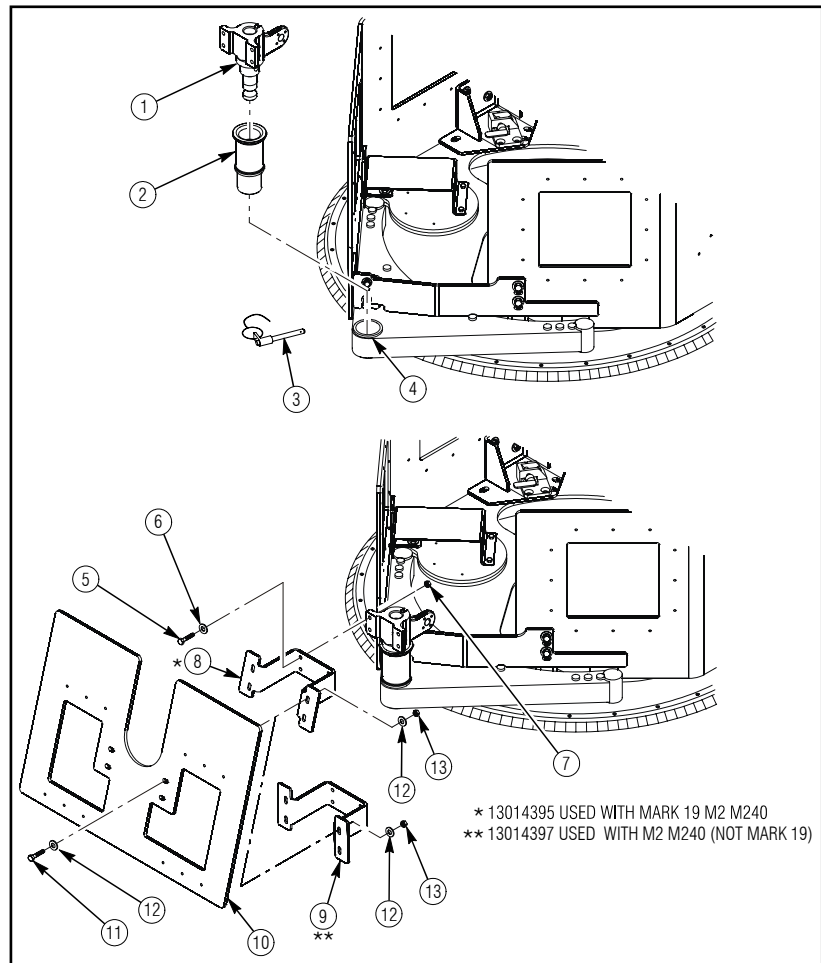


Figure 14

- c. Install 12012071 split sleeve (3) onto pintle adapter (1) and secure with 5140237 screw (4) as shown in figure 15.
- d. Install 12012065 locking handle assembly (5) into pintle adapter (1) as shown in figure 15.
- e. Insert 13014407 pintle adapter assembly (1) in bearing sleeve (2) as shown in figure 14.
- f. Attach 13014395 front spacer (8) to the pintle adapter assembly (1) using four 92620A628 hex bolts (5), four MS27183-14 washers (6) and four MS51943-35 locknuts (7) as shown in figure 14. Tighten hex bolts (5) to 37 lb-ft (50 N·m).
- g. Attach 13014394 front shield (10) to 13014395 (used with Mark 19 M2 M240) front spacer (8), or front spacer (9) 13014397 (used with M2 M240, not Mark 19) using four 92620A628 hex bolts (11), eight MS27183-14 washers (12) and four MS51943-35 locknuts (13) as shown in figure 14. Tighten hex bolts (11) to 37 lb-ft (50 N·m).

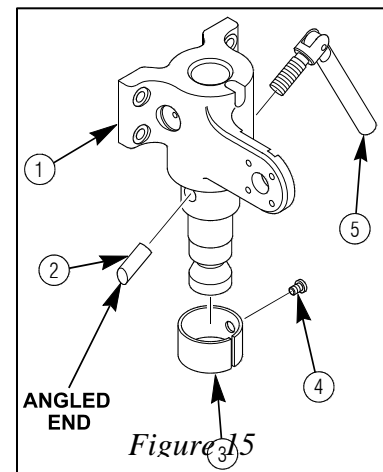


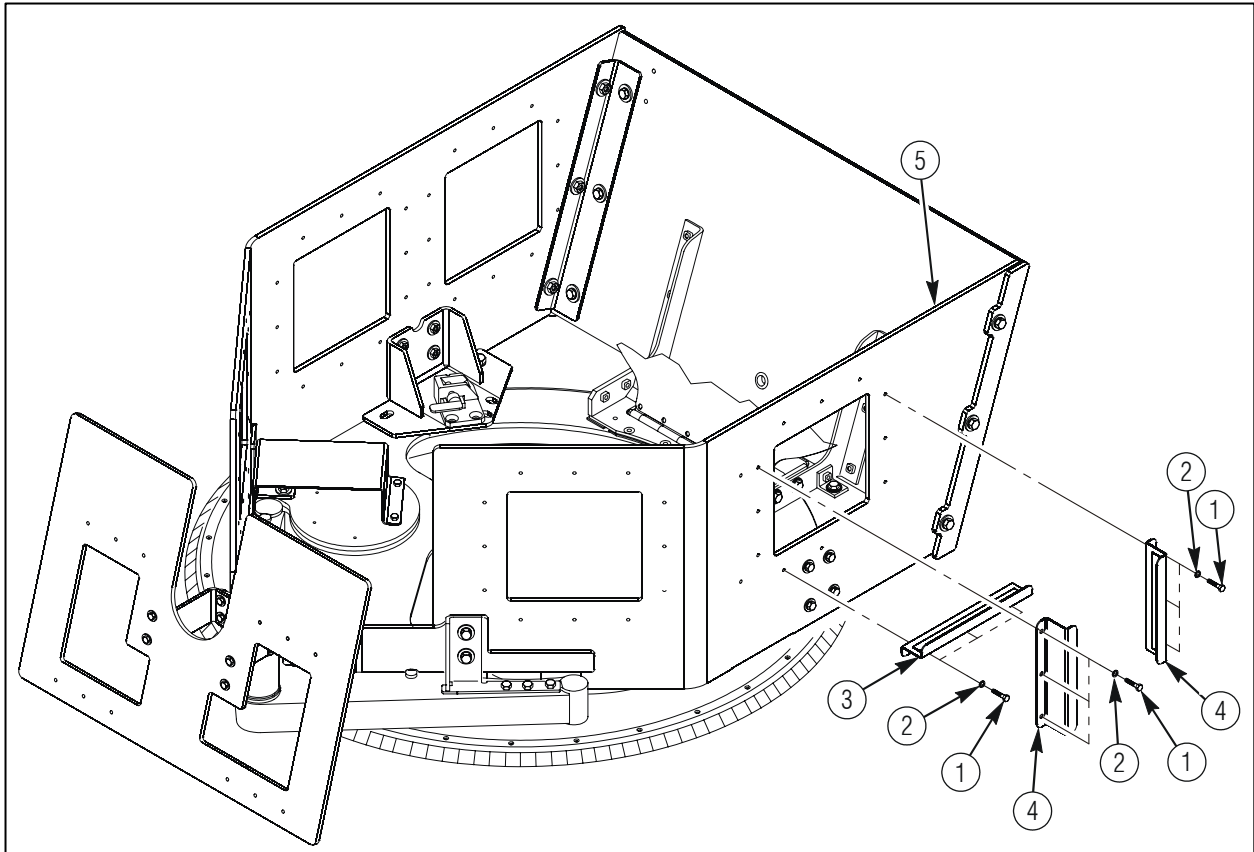
Figure 15

16. Attach windows as follows:

**NOTE**

Leaving bolts loose will make sliding glass into brackets easier.

- a. Attach five 13014399 bottom brackets (3) and ten 13014398 side brackets (4) to armor panels (5) using forty-five B1821BH031C063N hex bolts (1) and forty-five NASM35338-45 lockwashers (2) as shown in figure 16. Do not tighten hex bolts (1) at this time.

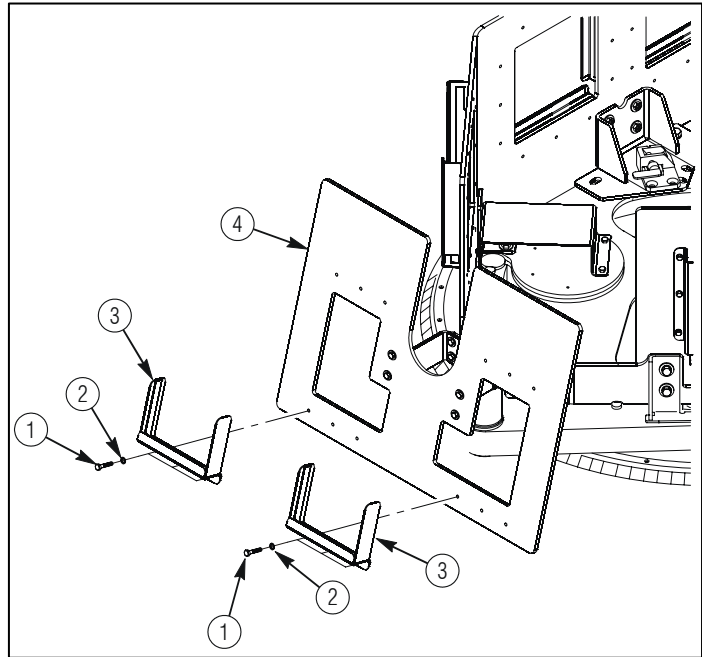


*Figure 16*

- b. Attach two 13014412 bottom tabbed brackets (3) to front shield (4) using three 13014410-20 hex bolts (1) and three 13014410-3 lockwashers (2) as shown in figure 17. Do not tighten hex bolts (1) at this time.

### **WARNING**

TO PROTECT GUNNER FROM BULLETS OR SHRAPNEL, GLASS **MUST** BE POSITIONED CORRECTLY. THE TRANSPARENT ARMOR GLASS (SIDE WITH LABEL) **MUST** FACE OUTWARD FROM TURRET.



*Figure 17*

### **CAUTION**

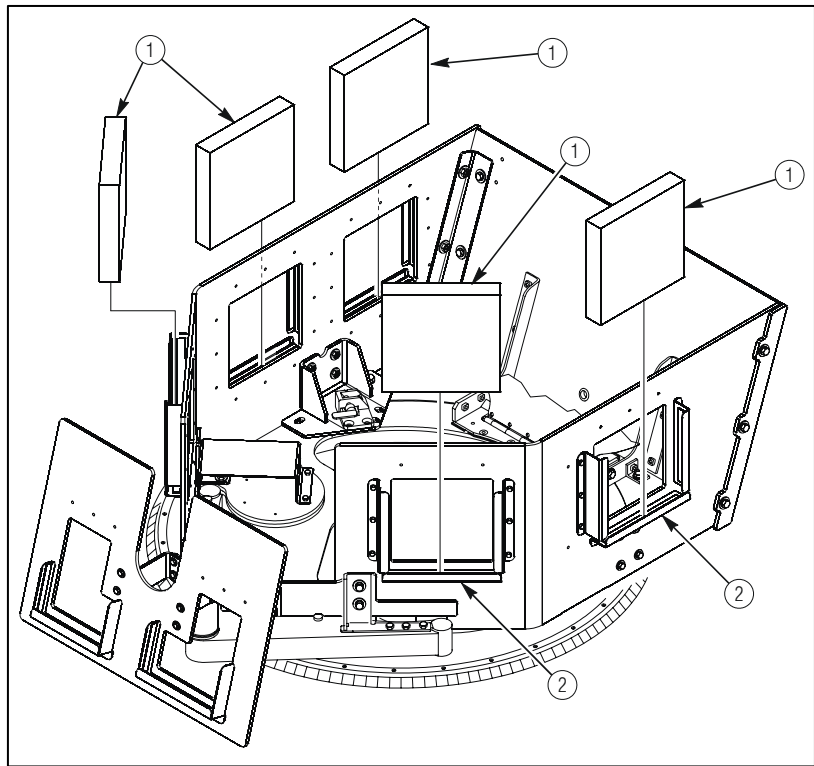
TO AVOID DAMAGE HANDLE GLASS WITH CARE.

### **NOTE**

Glass windows are layered with panes of transparent Armor glass and one smaller pane of ¼ plastic spall liner.

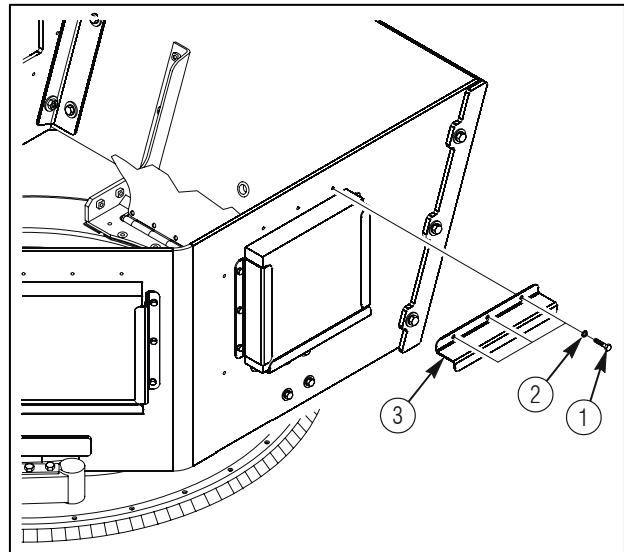
- c. Use the following three methods to verify windows are positioned correctly in window brackets.
- Ensure transparent armor glass (side with label) is facing outward from turret and spall liner is facing toward turret.
  - Plastic spall liner will scratch easier than glass. Take a sharp piece of metal and try to scribe a tiny line inside and outside of each window pane. The side that scratches easier is the spall liner and must face inward toward turret.
  - Using a coin, tap inside and outside of transparent armor. Plastic spall liner makes a softer (muffled) sound than the glass and must face inward toward turret.

- d. Remove protective film from five 13014384 12" x 12" panel windows (1) and slide panel windows (1) into bracket frames until snug against bottom window bracket (2) as shown in figure 18.



*Figure 18*

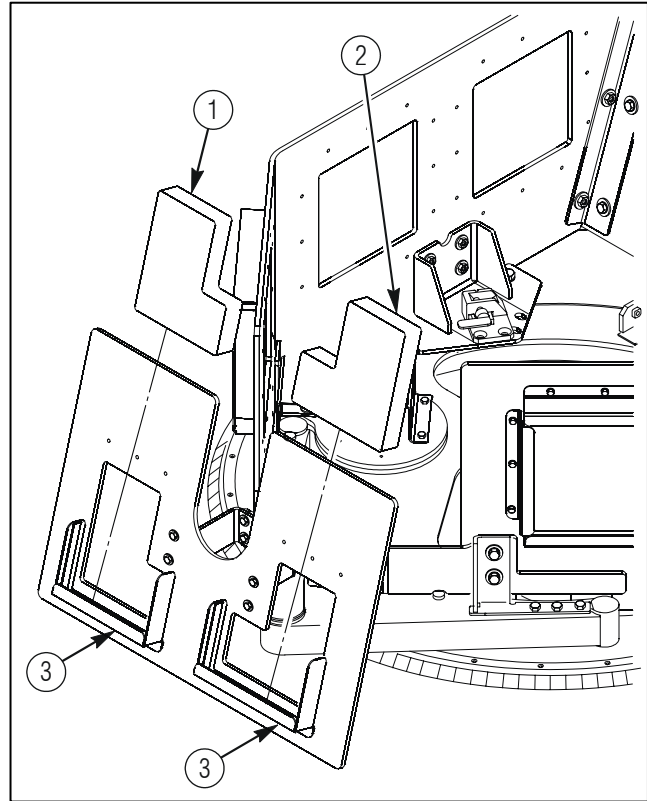
- e. Secure panel windows by attaching 13014399 top brackets (3) using fifteen B1821BH031C063N hex bolts (1) and fifteen NASM35338-45 lockwashers (2) as shown in figure 19.
- f. Tighten all hex bolts securing panel windows to left and right armor panels to 21 lb-ft (28 N·m).



*Figure 19*

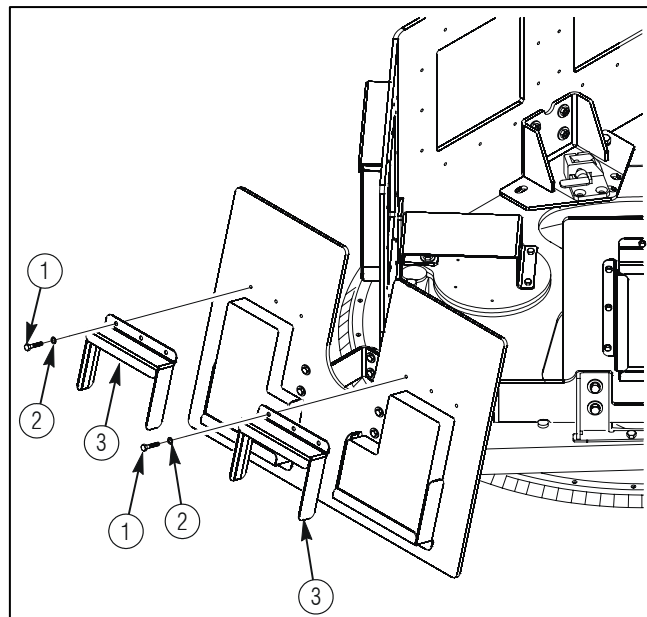


- g. Remove protective film from 13014390 window, front right (1) and 13014393 window, front left (2) and slide windows (1) & (2) into bottom tabbed brackets (3) as shown in figure 20.



*Figure 20*

- h. Secure shield windows by attaching 13014411 top tabbed brackets (3) using three 13014410-20 hex bolts (1) and three 13014410-3 lockwashers (2) as shown in figure 21.

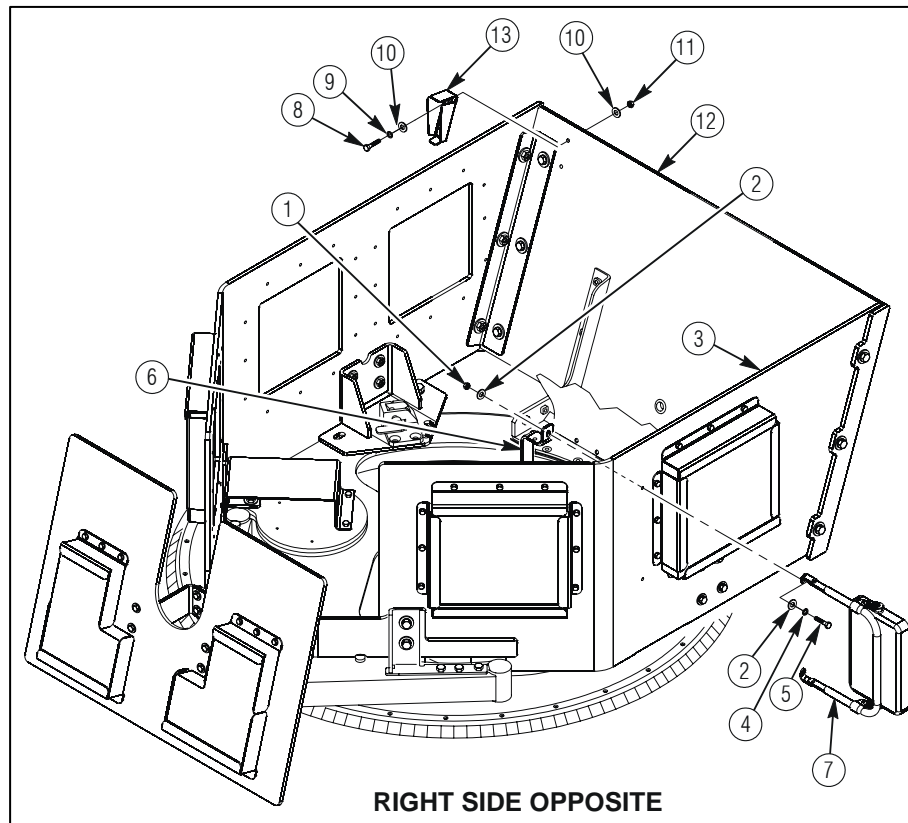


*Figure 21*

### **NOTE**

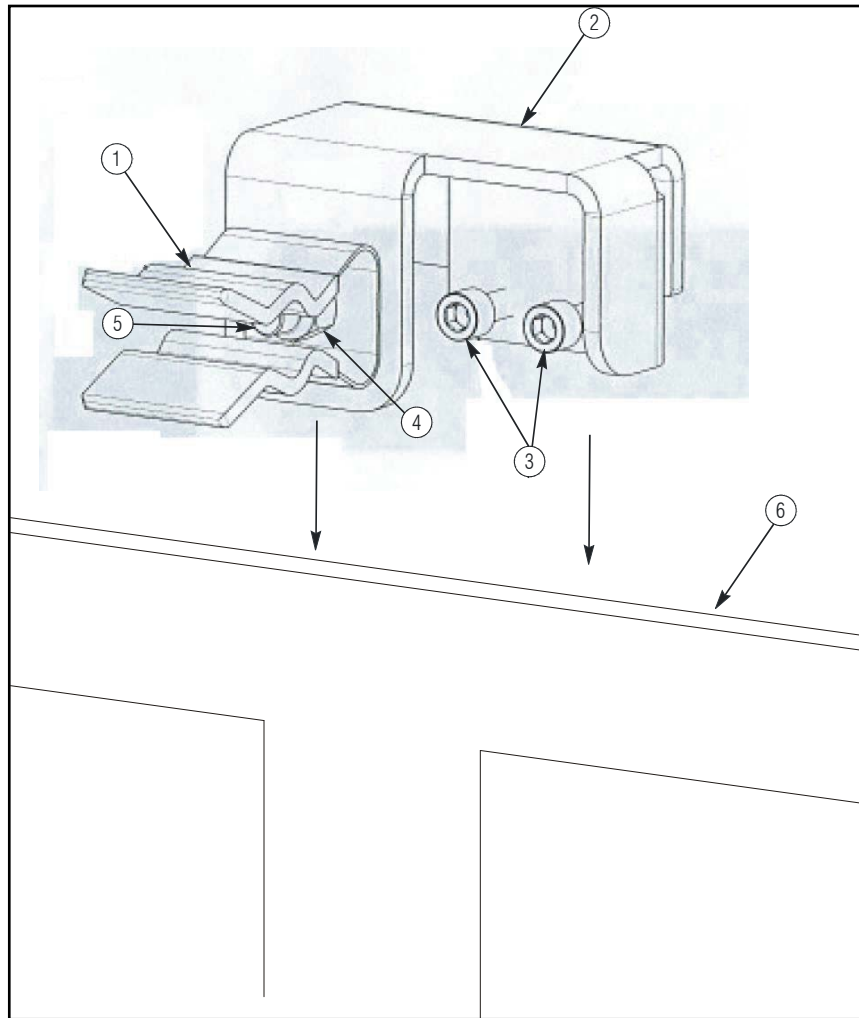
Mirror assembly kit 57K3214 comes with one long and one short mounting bracket already attached. Prior to attaching mirror assemblies, the mirror brackets must be removed and the two short brackets go on left side mirror assembly and the two longer brackets go on the right side assembly. Failure to do so will result in mirror sitting at an angle.

17. Attach 13014402 handle (6) and 12343061 left mirror (7) to left armor panel (3) using two 92620A587 hex bolts (5), two NASM35338-45 lockwashers (4), four MS27183-12 washers (2) and two MS51943-33 locknuts (1) as shown in figure 22. Tighten hex bolts (5) to 21 lb-ft (28 N·m).



*Figure 22*

18. Attach 13014402 handle and 12342130 right mirror to right armor panel using two 92620A587 hex bolts, two NASM35338-45 lockwashers, four MS27183-12 washers and two MS51943-33 locknuts. Tighten hex bolts to 21 lb-ft (28 N·m).
19. Attach 13014405 rear M4 bracket (13) to rear armor panel (12) using two B1821BH038C125N hex bolts (8), two NASM35338-46 lockwashers (9), four MS27183-14 washers (10) and two MS51943-35 locknuts (11) as shown in figure 22. Tighten hex bolts (8) to 37 lb-ft (50 N·m).



*Figure 22.1*

20. Assemble 13014416 front M4 bracket as follows:

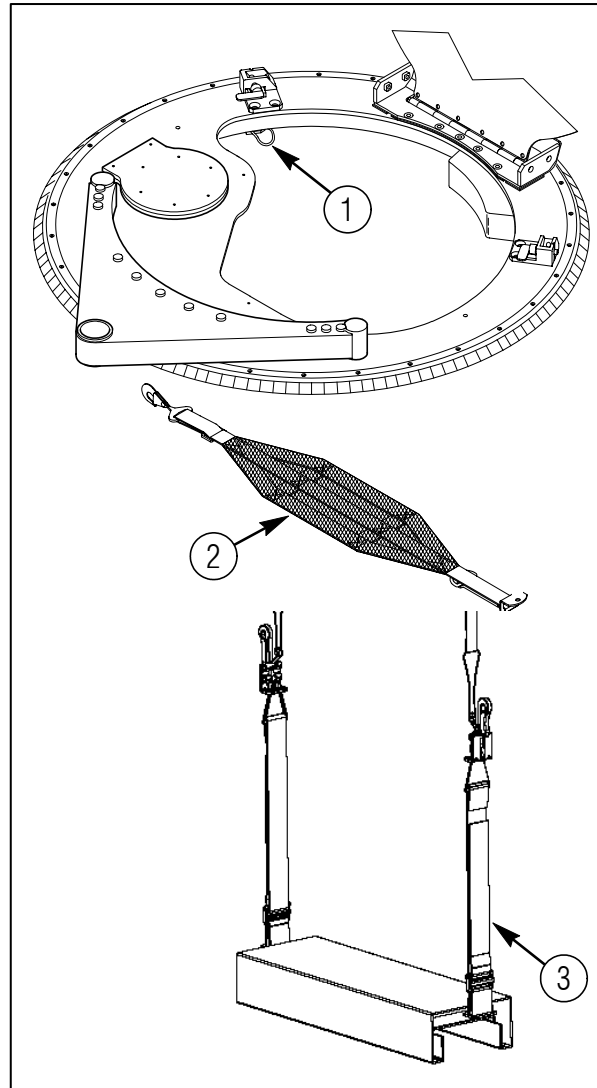
- a. Install two 91251A382 screws (3) to 13014415 front M4 bracket (2). Refer to figure 22.1. Do not tighten screws (3) at this time.
- b. Install 12367450 tension spring clip (1) to 13014415 front M4 bracket using B1821BH038C100N screw (5) and MS51943-35 lock nut (4). Refer to figure 22.1. Tighten screw (5) to 37 lb-ft (50 N·m).

21. Attach 13014416 front M4 bracket assembly to the left armor panel (6) as shown in figure 22.1. Tighten screws (3) to 21 lb-ft (28 N·m).

22. Attach 13014413 seat (3) as follows:

- a. Remove current mesh seat (2) and brackets from turret and replace with new seat brackets (1). Bracket loop should face away from rear turret bumper guards as shown in figure 23.
- b. Snap each quick-release device into hooks on turret ring. Snap-link opening/gate must face towards gunner. Quick release handle/lanyard must face away from gunner.

**LEVEL OF MAINTANANCE:**  
Unit



*Figure 23*

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## Section 2: Battery Powered Motorized Traversing Unit (BPMTU) Installation

### PROCEDURES:

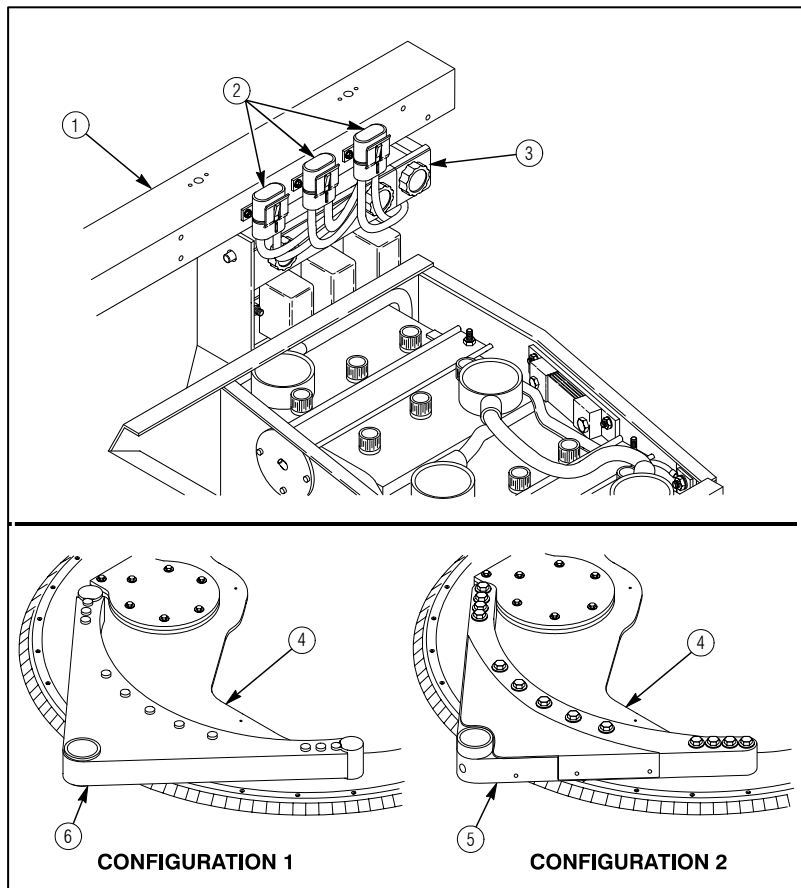
A. Prepare vehicle as follows:

1. Apply vehicle parking brake (TM 9-2320-387-10).
2. Remove companion seat assembly and battery box cover (TM 9-2320-387-24-2).

### **NOTE**

Do not install the battery powered motorized traversing unit kit on a vehicle that is not equipped with B-beam buss bar and fuses.

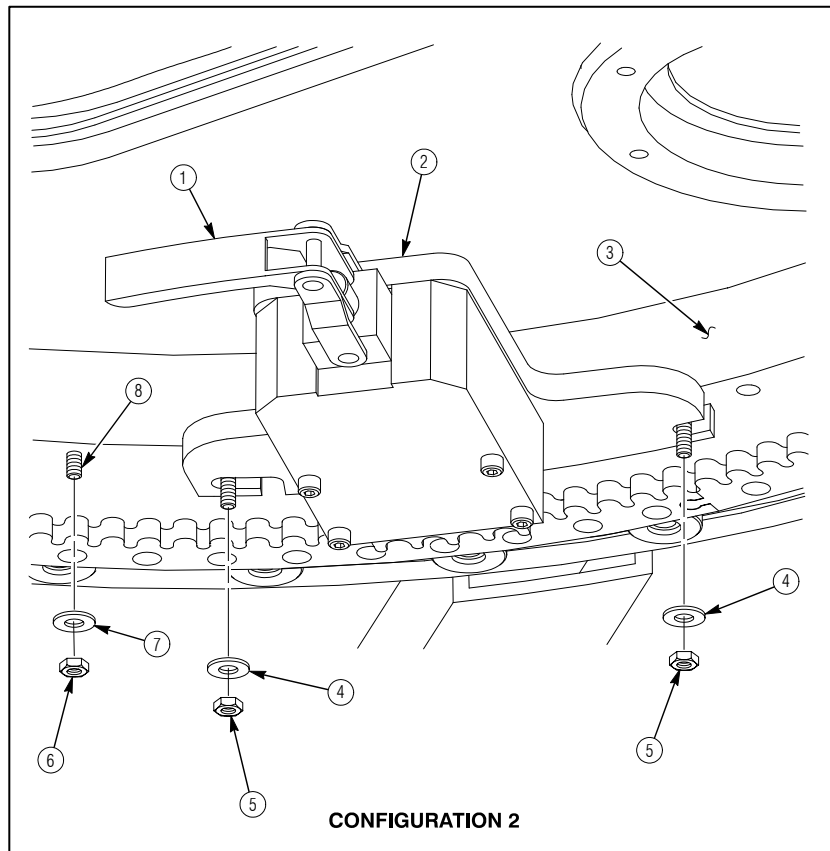
3. Visually inspect vehicle right side B-beam (1) to determine if B-beam buss bar (3) and fuses (2) are installed. If vehicle is not equipped with B-beam buss bar (3) and fuses (2), reinstall companion seat assembly and battery box cover and do not continue installation. Refer to figure 24. If vehicle is equipped with B-beam buss bar (3) and fuses (2), continue to next step.



*Figure 24*

4. Visually inspect vehicle turret (4) to determine which configuration of pintle weapon mount (5 or 6) is installed. Refer to figure 24.

5. Remove turret brake assembly as follows:
  - a. If **CONFIGURATION 1** pintle weapon mount is installed, remove turret brake assembly (TM 9-2320-387-24-2). Leave capscrews loose at this point.
  - b. If **CONFIGURATION 2** pintle weapon mount is installed, disengage turret brake (2) by pulling handle (1) outward. Remove two locknuts (5), washers (4), and turret brake (2) from turret bearing (3). Discard locknuts (5). Refer to figure 25.
  - c. If **CONFIGURATION 2** pintle weapon mount is installed, remove locknut (6) and washer (7) from capscrew (8) as shown in figure 25. Discard locknut (6).
6. Disconnect battery ground cables (TM 9-2320-387-24-1).
7. Remove wire cover and right front bracket from O-GPK. Refer to **SECTION 1**, Step 10, c. Discard lockwasher and locknut.
8. Remove front turret armor-mounted hatch latch located nearest the pintle (TM 9-2320-387-24-2).



*Figure 25*

## **CAUTION**

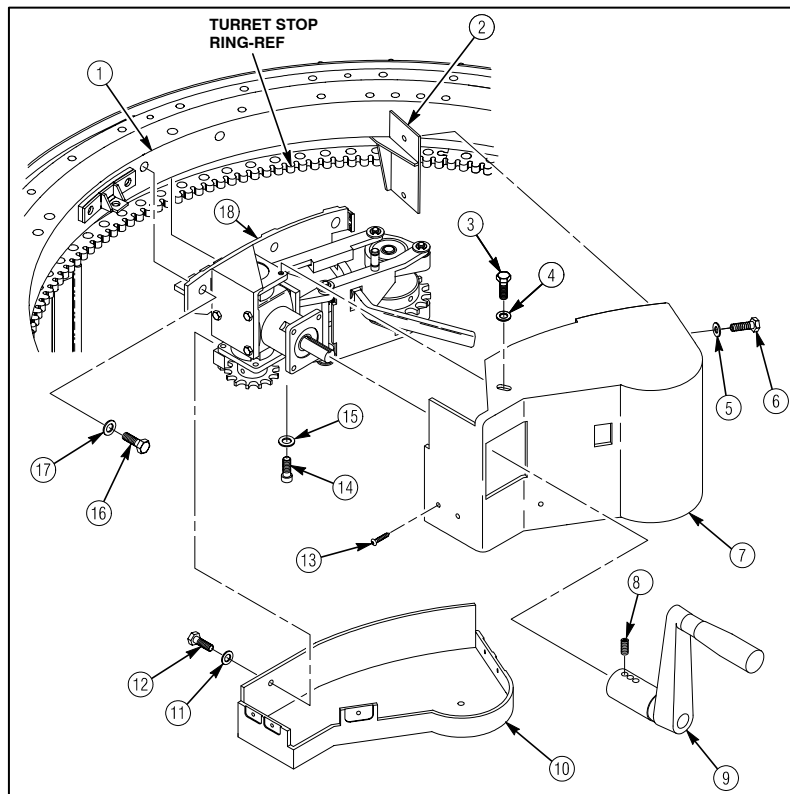
THE INSTALLATION INSTRUCTIONS FOR THE BATTERY POWERED MOTORIZED TRAVERSING UNIT CALL FOR THE REMOVAL OF THE TURRET TRAVERSING GEAR LINKAGE ASSEMBLY. THIS REMOVAL IS STRONGLY RECOMMENDED. FAILURE TO DISENGAGE THE TRAVERSING GEAR LINKAGE ASSEMBLY WHILE OPERATING THE BATTERY POWERED MOTORIZED TRAVERSING UNIT COULD CAUSE DAMAGE TO EQUIPMENT AND SERIOUS BODILY HARM.

9. Remove traversing gear assembly and covers as follows:

a. Loosen three setscrews (8) and remove handle (9) as shown in figure 26.

b. Remove capscrew (12) and washer (11) that secures traversing lower cover (10) to traversing gear assembly (18) as shown in figure 26.

c. Remove five screws (13) and traversing lower cover (10) from traversing upper cover (7). Refer to figure 26.



*Figure 26*

d. Remove capscrew (3) and washer (4) that secures traversing upper cover (7) to traversing gear assembly (18) as shown in figure 26.

e. Remove two capscrews (6), washers (5), and traversing upper cover (7) from front cover bracket (2). Refer to figure 26.



- f. Remove two capscrews (16) and washers (17) securing traversing gear assembly (18) to side of turret bearing (1). Refer to figure 26 (pg.24).

### **NOTE**

In order to loosen socket head capscrew, allen wrench must be inserted through a hole in turret stop ring. Rotate turret as required to gain access from below.

- g. Loosen socket head capscrew (14) and remove traversing gear assembly (18) from turret bearing (1). Refer to figure 26 (pg.24).
- h. Remove socket head capscrew (14) and washer (15) from turret bearing (1) as shown in figure 26 (pg.24).
10. Remove right rear rifle support (TM 9-2320-387-24-2).
11. Remove four capscrews, two on top (1), two on bottom (6), lockwashers (5), washers (7), and right side B-beam panel (3) from B-beam (2) as shown in figure 27. Discard lockwashers (5).

### **CAUTION**

ENSURE WIRING ON FRONT SIDE OF B-BEAM PANEL IS HELD OUT OF THE WAY BEFORE CUTTING OR DRILLING. FAILURE TO DO SO MAY RESULT IN DAMAGE TO EQUIPMENT.

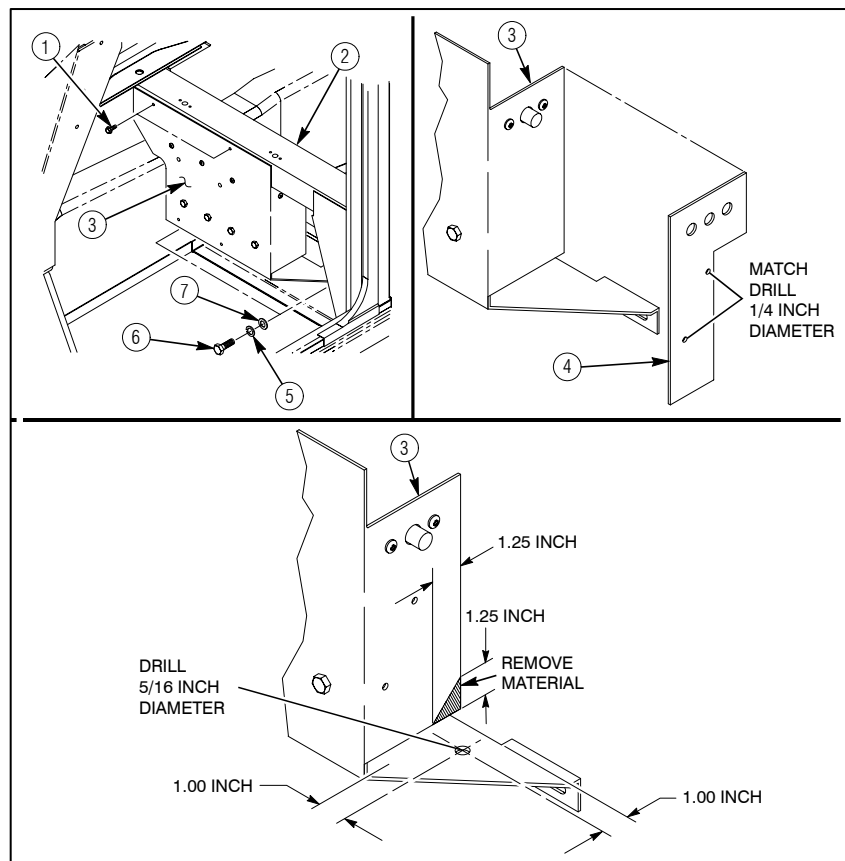


Figure 27

12. Position 6432544-01M1 fuse locator template (4) on side of B-beam panel (3), clamp in place, and match drill two 1/4 inch diameter holes through B-beam panel (3). Remove fuse locator template (4) from B-beam panel (3). Refer to figure 27.

13. Locate and drill one 5/16 inch diameter hole in B-beam panel (3) as shown in figure 27 (pg 25).

14. Remove material from lower corner on side of B-beam panel (3) as shown in figure 27 (pg.25).

15. Locate and drill one 25/64 inch diameter hole in right side B-beam gusset (1) as shown in figure 28.

16. Repair finish all edges that have been cut, ground, or drilled using appropriate primer per MIL-C-53072.

17. Install one 4397050-025 upset nut (2) in right side B-beam gusset (1) using blind rivet tool kit (NSN 5150-01-201-4978). Refer to figure 28.

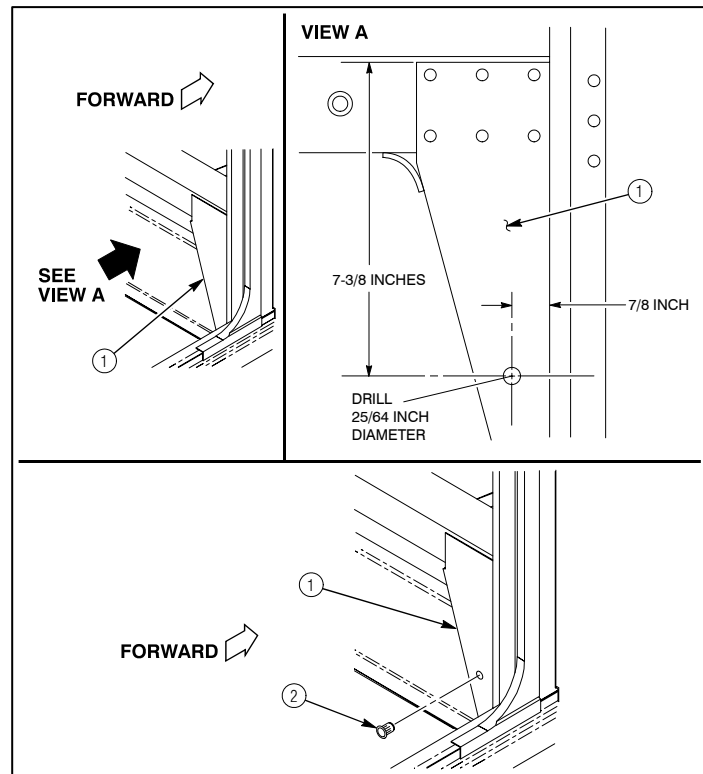


Figure 28

B. Install battery box assembly, fuse, and batteries as follows:

1. Install 6435451-01M1 or 6435451-200M1 battery box assembly (5) on bottom four holes on the objective gunner protection kit rear plate (1) and secure with four existing capscrews (4), existing lockwashers (3), and existing washers (2) as shown in figure 29. Tighten capscrews (4) to 37 lb-ft (50 N·m).

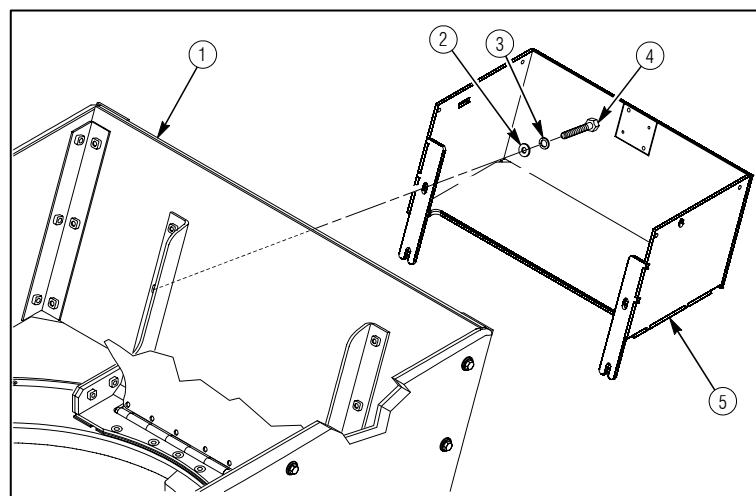
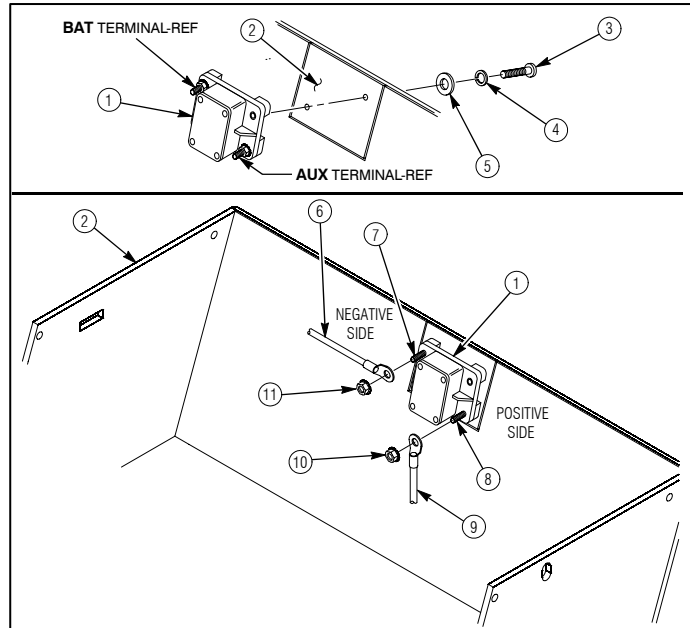


Figure 29

2. Install 6432525-01M1 fuse (1) inside back of battery box assembly (2) and secure with two 4397013-076 screws (3), 4397004-005 lockwashers (4), and 4397005-008 washers (5) as shown in figure 30. Tighten screws (3) to 68 lb-in (8 N·m).
3. Remove nut (11) from BAT terminal (7) on fuse (1) and connect 6432542-01M1 cable assembly (**NEGATIVE**) (6) to BAT terminal (7). Install nut (11) and tighten to 10 lb-ft (14 N·m).

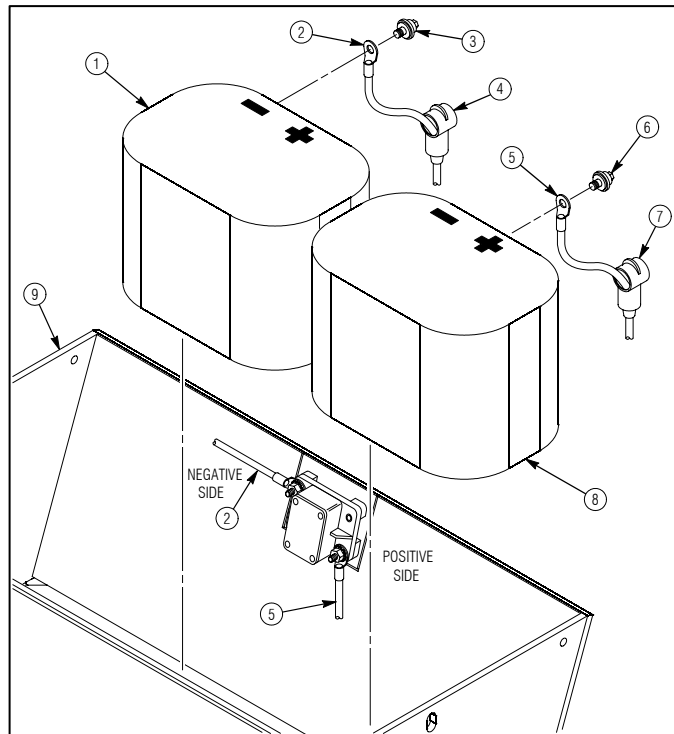
Refer to figure 30.



*Figure 30*

4. Remove nut (10) from AUX terminal (8) on fuse (1) and connect 6432543-01M1 cable assembly (**POSITIVE**) (9) to AUX terminal (8). Install nut (10) and tighten to 10 lb-ft (14 N·m). Refer to figure 30.
5. Route 6432531-01M1 wire harness around backside of hatch assembly and into hole in rear armor plate.

6. Install two 6432526-01M1 batteries (1 and 8) into battery box assembly (9) as shown in figure 31.
7. Connect 6432543-01M1 cable assembly (5) to **POSITIVE (+)** terminal of battery (8) and secure with 6432546-01M1 battery terminal bolt (6) as shown in figure 31. Tighten battery terminal bolt (6) to 70 lb-in (8 N·m). and slide boot (7) over connection.
8. Connect 6432542-01M1 cable assembly (2) to **NEGATIVE (-)** terminal of battery (1) and secure with 6432546-01M1 battery terminal bolt (3) as shown in figure 31. Tighten battery terminal bolt (3) to 70 lb-in (8 N·m). and slide boot (4) over connection.



*Figure 31*

C. Install motor and drive assembly as follows:

1. If **CONFIGURATION 1** pintle weapon mount (6) is installed, complete steps C.2. through C.11. If **CONFIGURATION 2** pintle weapon mount (5) is installed, complete steps C.13 through C.20. Refer to figure 24 (pg.22).
2. Loosen capscrew (2) as shown in figure 32.

### **WARNING**

**DO NOT INSTALL MOTOR AND DRIVE ASSEMBLY WITHOUT DRIVE MOUNT LOCK. FAILURE TO INSTALL AND SECURE DRIVE MOUNT LOCK MAY RESULT IN INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.**

3. Loosen capscrews (1 and 3) as required. Install 6432501-01M1 drive mount lock (4) onto two pintle weapon mount capscrews (1 and 3) as shown in figure 32. Do not tighten capscrews (1 and 3) at this time.

### **NOTE**

Ensure motor engagement control is in neutral position.

4. If necessary, move motor engagement control (6) to NEUTRAL position by pushing in and rotating down. Refer to figure 32.

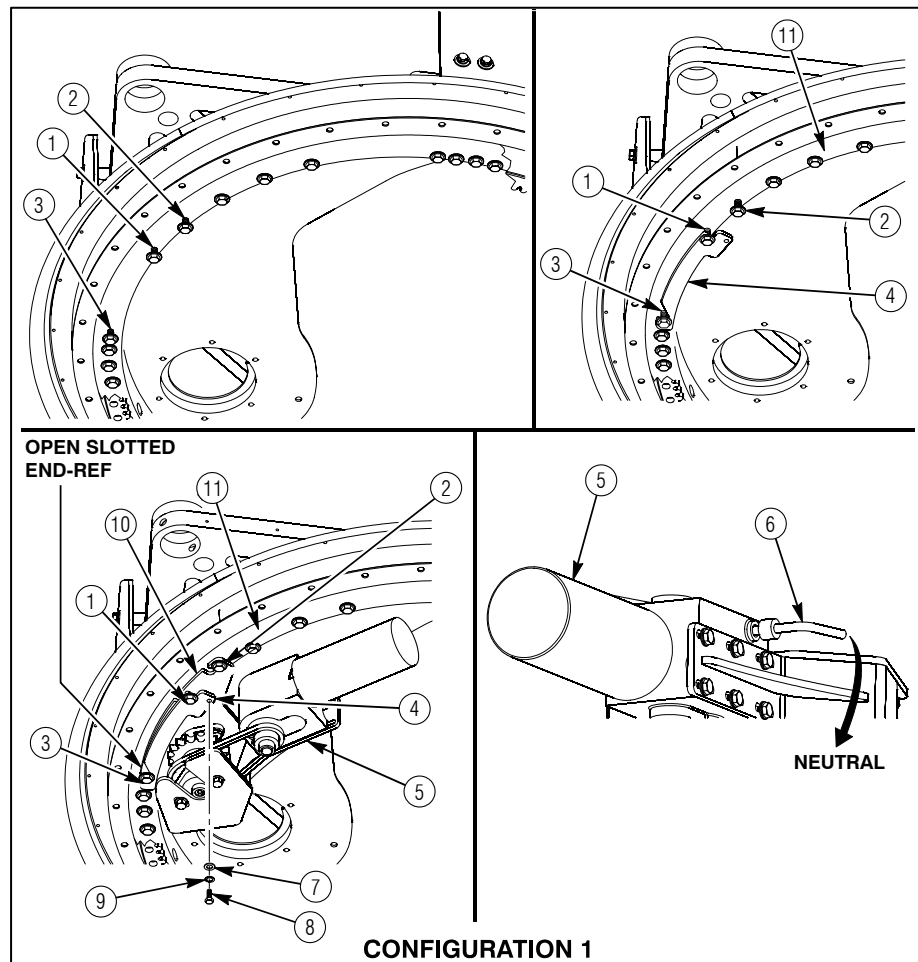


Figure 32

5. Start 6433255-01M1 motor and drive assembly (5) installation by sliding open slotted end of mounting bracket (10) onto capscrew (3), between drive mount lock (4) and turret bearing (11). Refer to figure 32 (pg.28).
6. Complete installation of motor and drive assembly (5) by rotating unit to engage two capscrews (1 and 2) in locking slots of mounting bracket (10). Move motor and drive assembly (5) counterclockwise to lock in place. Refer to figure 32 (pg.28).
7. Align hole in drive mount lock (4) with threaded hole in mounting bracket (10) and temporarily install 4397000-006 capscrew (8), as shown in figure 32 (pg.28). Do not tighten capscrew (8) at this time.
8. Tighten two capscrews (2 and 3) to 37 lb-ft (50 N·m). Refer to figure 32 (pg.28).
9. Remove capscrew (8). Refer to figure 32 (pg.28).
10. Tighten capscrew (1) to 37 lb-ft (50 N·m). Refer to figure 32 (pg.28).
11. Install capscrew (8), 4397004-006 lockwasher (9), and 4397005-010 washer (7) as shown in figure 32 (pg.28). Tighten capscrew (8) to 10 lb-ft (14 N·m).

12. **CONFIGURATION 1**  
pintle weapon mount  
skip to section D.

13. **CONFIGURATION 2**  
pintle weapon mount,  
install three existing  
washers (12) and  
4397064-005 locknuts  
(11) on pintle weapon  
mount capscrews (1, 2,  
and 3) as shown in  
figure 33. Hand start  
locknuts (11) and do  
not tighten at this time.

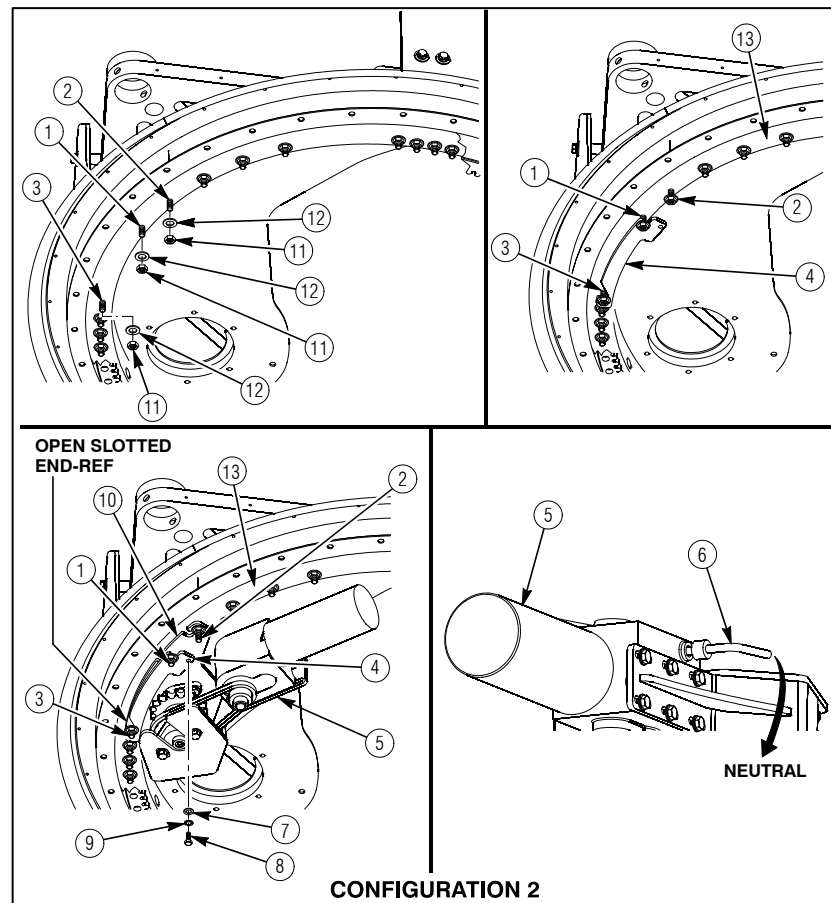


Figure 33

## **WARNING**

**DO NOT INSTALL MOTOR AND DRIVE ASSEMBLY WITHOUT DRIVE MOUNT LOCK. FAILURE TO INSTALL AND SECURE DRIVE MOUNT LOCK MAY RESULT IN INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.**

14. Install 6432501-01M1 drive mount lock (4) onto two pintle weapon mount capscrews (1 and 3) as shown in figure 33 (pg.29).

## **NOTE**

Ensure motor engagement control is in neutral position.

15. If necessary, move motor engagement control (6) to NEUTRAL position by pushing in and rotating down. Refer to figure 33 (pg.29).
16. Start 6433255-01M1 motor and drive assembly (5) installation by sliding open slotted end of mounting bracket (10) onto capscrew (3), between drive mount lock (4) and turret bearing (13). Refer to figure 33 (pg.29).
17. Complete installation of motor and drive assembly (5) by rotating unit to engage two capscrews (1 and 2) in locking slots of mounting bracket (10). Move motor and drive assembly (5) counterclockwise to lock in place. Refer to figure 33 (pg.29).
18. Align hole in drive mount lock (4) with threaded hole in mounting bracket (10) and install 4397000-006 capscrew (8), 4397004-006 lockwasher (9), and 4397005-010 washer (7) as shown in figure 33 (pg.29). Do not tighten capscrew (8) at this time.
19. Hold locknuts (11) and tighten three capscrews (1, 2, and 3) to 37 lb-ft (50 N·m). Refer to figure 33 (pg.29).
20. Tighten capscrew (8) to 10 lb-ft (14 N·m). Refer to figure 33 (pg.29).

D. Install night vision cover plate and system control box assembly as follows:

1. Install 6432502-01M1 or 6432502-200M1 night vision cover plate (18) and 6432878-01M1 night vision cover plate seal (17) on turret armor (6) and secure with two existing capscrews (1), four existing washers (16), 4397064-006 locknut (15) and 4397064-005 locknut as shown in figure 34. Do not tighten locknuts (15) at this time.
2. Apply sealing compound to threads of two existing capscrews (3). Refer to figure 34.
3. Install existing nut ring (8) and 6435123-01M1 control box seal (7) under turret armor (6). Ensure all mounting holes in nut ring (8) align with mounting holes in night vision cover plate (18), and cutout in control box seal (7) is aligned with cutout in night vision cover plate (18). Secure with two existing capscrews (3) and existing washers (2) as shown in figure 34. Do not tighten capscrews (3) at this time.
4. Install four 6432884-01M1 tap bolts (4) and four existing washers (5) as shown in figure 34. Tighten two capscrews (3) to 37 lb-ft (50 N·m), two locknuts (15) to 37 lb-ft (50 N·m), and four tap bolts (4) to 37 lb-ft (50 N·m).
5. Install 6432530-01M1 system control box assembly (9) on four tap bolts (4) and secure with four 4397005-014 washers (10), 4397004-008 lockwashers (11), and 6430529-06M1 nuts (12) as shown in figure 34. Tighten nuts (12) to 37 lb-ft (50 N·m).

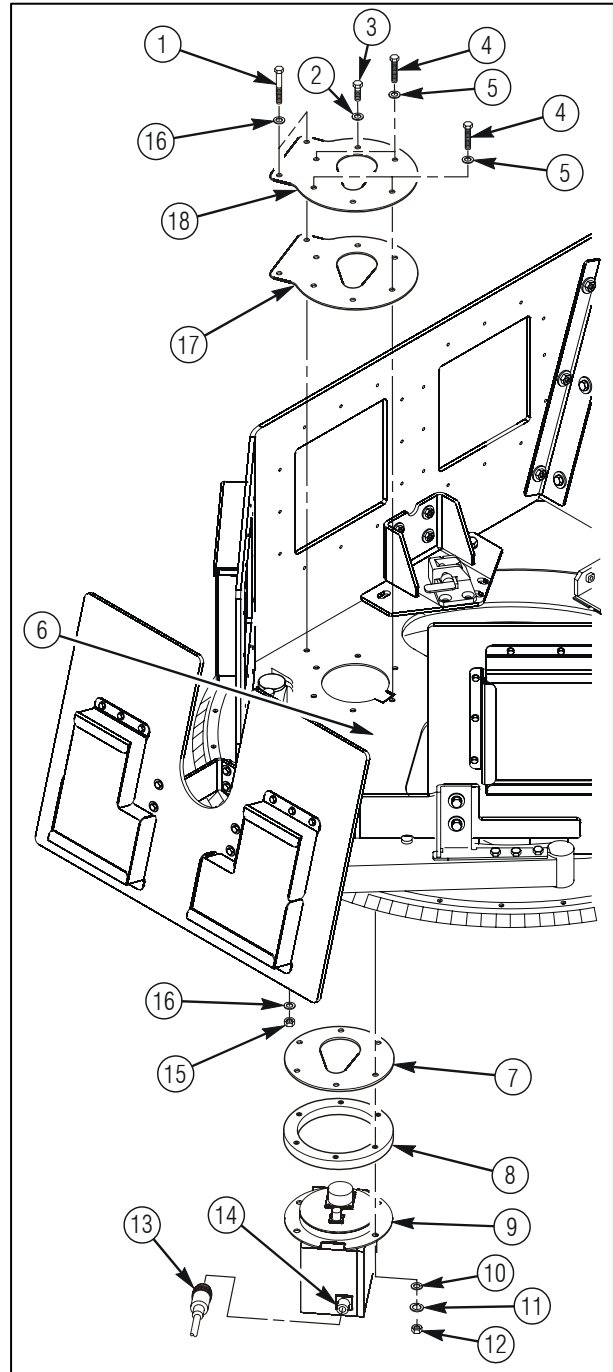


Figure 34

6. Connect motor electrical connector (13) to electrical connector (14) on side of system control box assembly (9) as shown in figure 34.

E. Install fuse on B-beam panel as follows:

1. Remove nut (2) from 6432525-01M1 fuse (5) and connect 6432541-01M1 cable assembly (1) to BAT terminal (12). Install nut (2) and tighten to 10 lb-ft (14 N·m). Refer to figure 35.

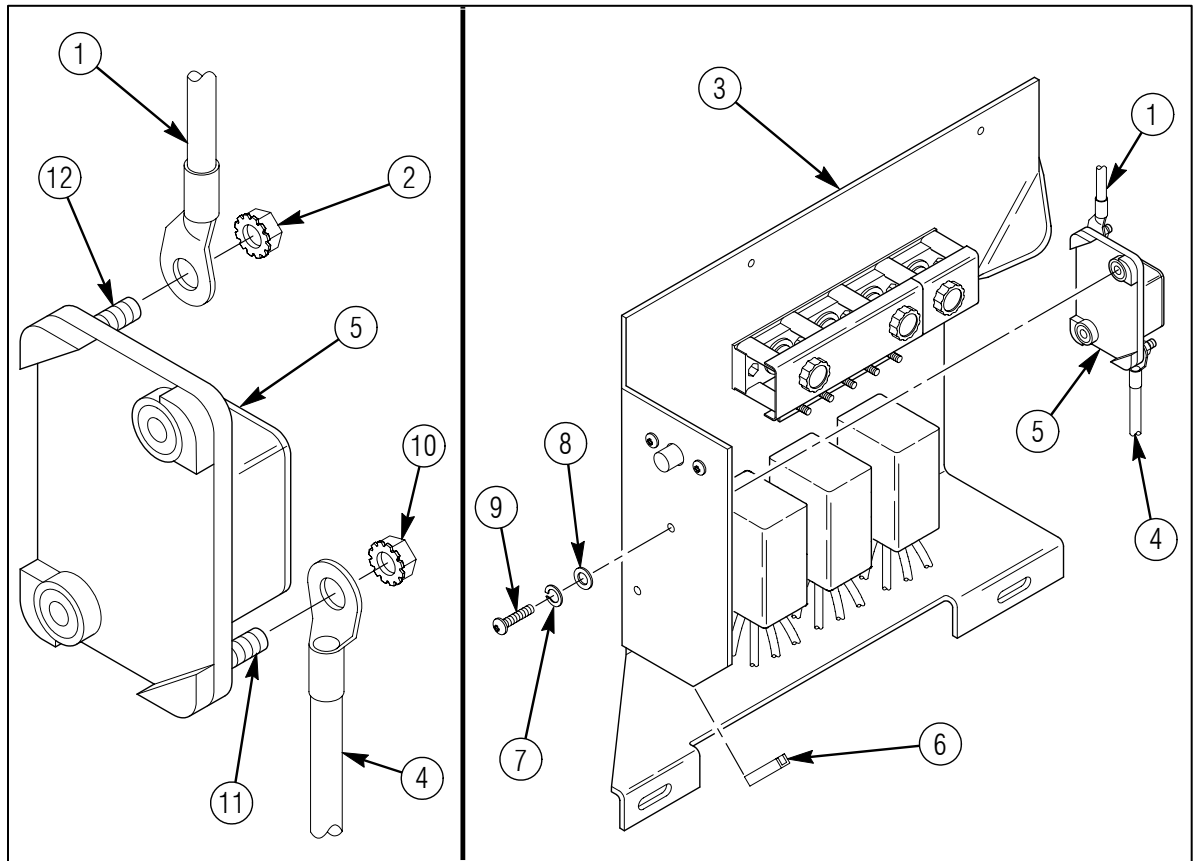


Figure 35

2. Remove nut (10) from 6432525-01M1 fuse (5) and connect POSITIVE (red) lead (4) of 6432538-01M1 wire harness (4) to AUX terminal (11). Install nut (10) and tighten to 10 lb-ft (14 N·m). Refer to figure 35.
3. Install 1-3/4 inch long piece of 1000049-003 edge trim (6) on cut edge of B-beam panel (3) as shown in figure 35.
4. Install 6432525-01M1 fuse (5), with cable assembly (1) and wire harness (4) attached, inside B-beam panel (3) and secure with two 4397013-074 screws (9), 4397004-005 lockwashers (7), and 4397005-008 washers (8) as shown in figure 35. Tighten screws (9) to 68 lb-in (8 N·m).



F. Connect wire harness and cable assembly to vehicle buss bars as follows:

1. Remove nut (8) from vehicle grounding buss bar (17) as shown in figure 36.

2. Connect NEGATIVE (black) lead (9) of 6432538-01M1 wire harness (11) to vehicle grounding buss bar (17) and secure with nut (8) as shown in figure 36. Tighten nut (8) to 80 lb-in. (9 N·m).

3. Remove small cover assembly (6) from vehicle power buss bar (2) as shown in figure 36.

4. Remove nut (5) and all electrical cables except the vehicle buss bar power supply cable (7). Refer to figure 36.

5. Install 6432541-01M1 cable assembly (1), vehicle fuse connectors (3), and air conditioning power connector (4) as shown in figure 36. Secure with nut (5) and tighten to 80 lb-in. (9 N·m).

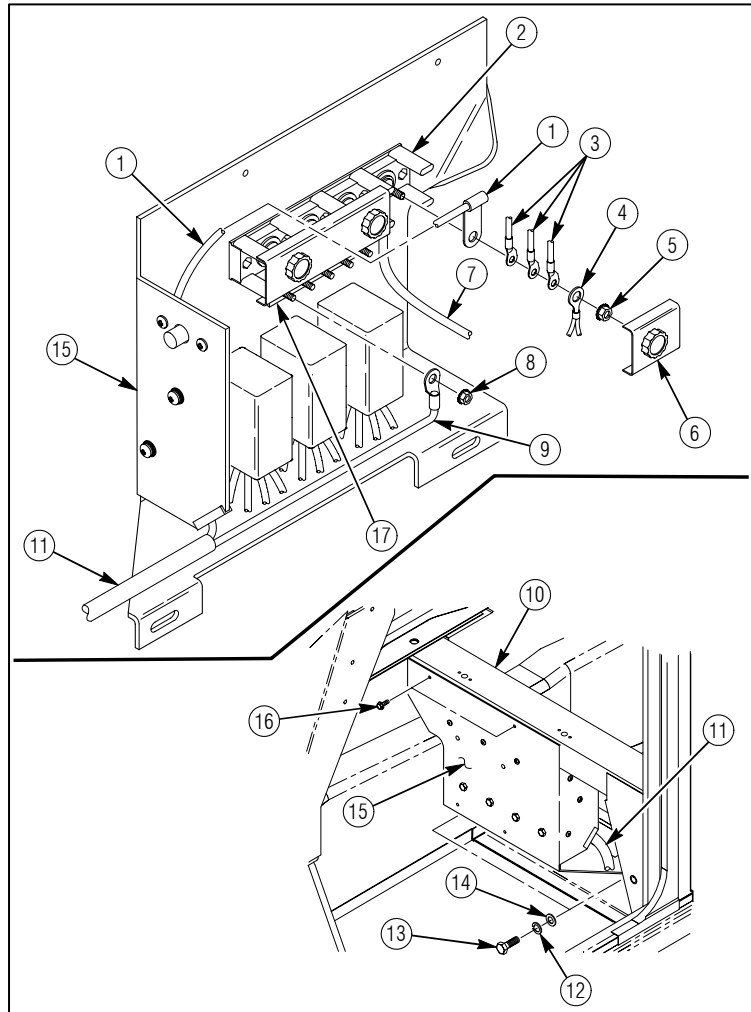


Figure 36

6. Install small cover assembly (6) on vehicle power buss bar (2) as shown in figure 36.

G. Install B-beam panel as follows:

### **CAUTION**

ENSURE WIRING ON FRONT SIDE OF B-BEAM PANEL IS NOT PINCHED BETWEEN B-BEAM PANEL AND B-BEAM. FAILURE TO DO SO MAY RESULT IN DAMAGE TO EQUIPMENT.

1. Position B-beam panel (15) in place against right side B-beam (10) and ensure no wires are pinched between the B-beam panel (15) and right side B-beam (10). Refer to figure 36 (pg.33).
2. Route harness assembly (11) through opening in B-beam panel (15) provided by removing material on lower front corner of B-beam panel (15). Refer to figure 36 (pg.33).
3. Secure top of B-beam panel (15) to right side B-beam (10) with two existing screws (16) as shown in figure 36 (pg.33).
4. Secure bottom of B-beam panel (15) with two existing capscrews (13), two 4397004-006 lockwashers (12), and two existing washers (14) as shown in figure 36 (pg.33). Tighten capscrews (13) to 6 lb-ft. (8 N·m).

H. Complete harness assembly installation as follows:

1. Remove two capscrews (14) and washers (4) from right side of turret support (3) as shown in figure 37.
2. Install two 6432788-01M1 loop clamps (2) on 6432538-01M1 wire harness (5) near the break-away connector (1) as shown in figure 37.
3. Apply sealing compound to threads of two existing capscrews (14). Refer to figure 37.
4. Secure two loop clamps (2) to right side of turret support (3) with existing capscrews (14) and washers (4) as shown in figure 37. Do not tighten capscrews (18) at this time.

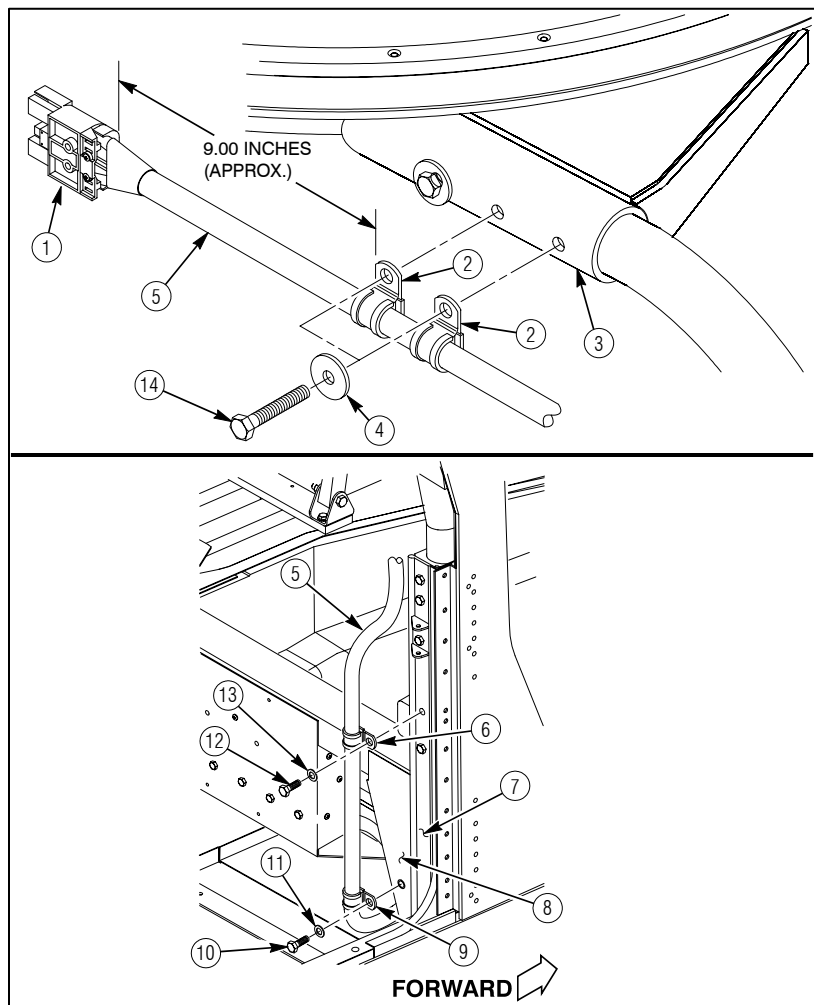


Figure 37

5. Adjust end of wire harness (5) in loop clamps (2) to leave approximately 9.00 inches of wire harness (5) extending beyond loop clamp (2) as shown in figure 37 (pg.34). Tighten two capscrews (14) to 37 lb-ft. (50 N·m).
6. Install 6432788-01M1 loop clamp (6) on 6432538-01M1 wire harness (5) as shown in figure 37 (pg.34).
7. Remove capscrew (12) and washer (13) from back side of B-pillar (7) as shown in figure 37 (pg.34).
8. Apply sealing compound to threads of existing capscrew (12). Refer to figure 14 (pg.34).
9. Secure loop clamp (6) to back side of B-pillar (7) with existing capscrew (12) and washer (13) as shown in figure 37 (pg.34). Tighten capscrew (12) to 21 lb-ft. (28 N·m).
10. Install 6432788-01M1 loop clamp (9) on 6432538-01M1 wire harness (5) as shown in figure 37 (pg.34).
11. Apply sealing compound to threads of 4397000-006 capscrew (10). Refer to figure 37.
12. Secure loop clamp (9) to B-beam gusset (8) with 4397000-006 capscrew (10) and 4397005-010 washer (11) as shown in figure 37 (pg.34). Tighten capscrew (10) to 6 lb-ft. (8 N·m).
13. Secure 6432538-01M1 wire harness (5) along B-pillar (7) with three 6432885-01M1 cable ties as required. Refer to figure 37 (pg.34).
14. Apply sealing compound to threads of 4397000-006 capscrew (2). Refer to figure 38.
15. Install 6432788-01M1 loop clamp (7) on 6432538-01M1 wire harness (5) as shown in figure 38.
16. Route 6432538-01M1 wire harness (5) forward along B-pillar (4) and then along back of vehicle battery box (3) as shown in figure 38

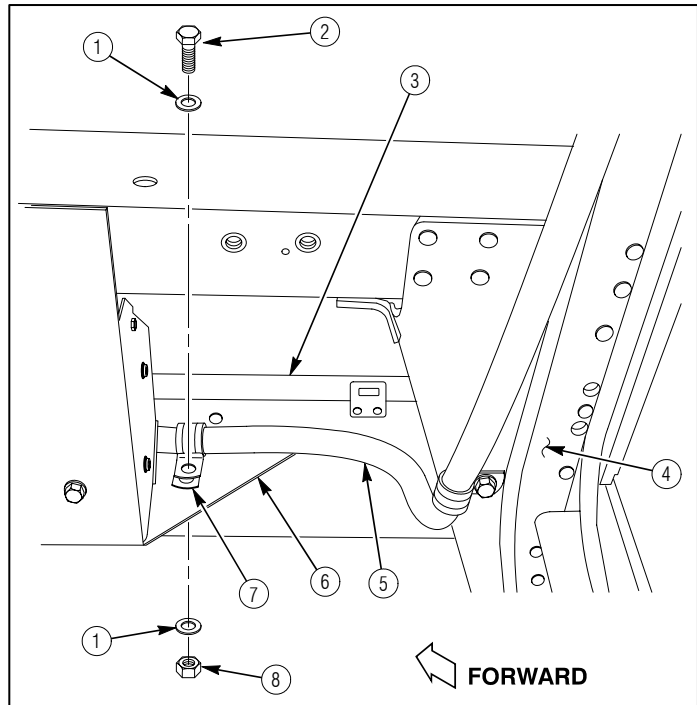
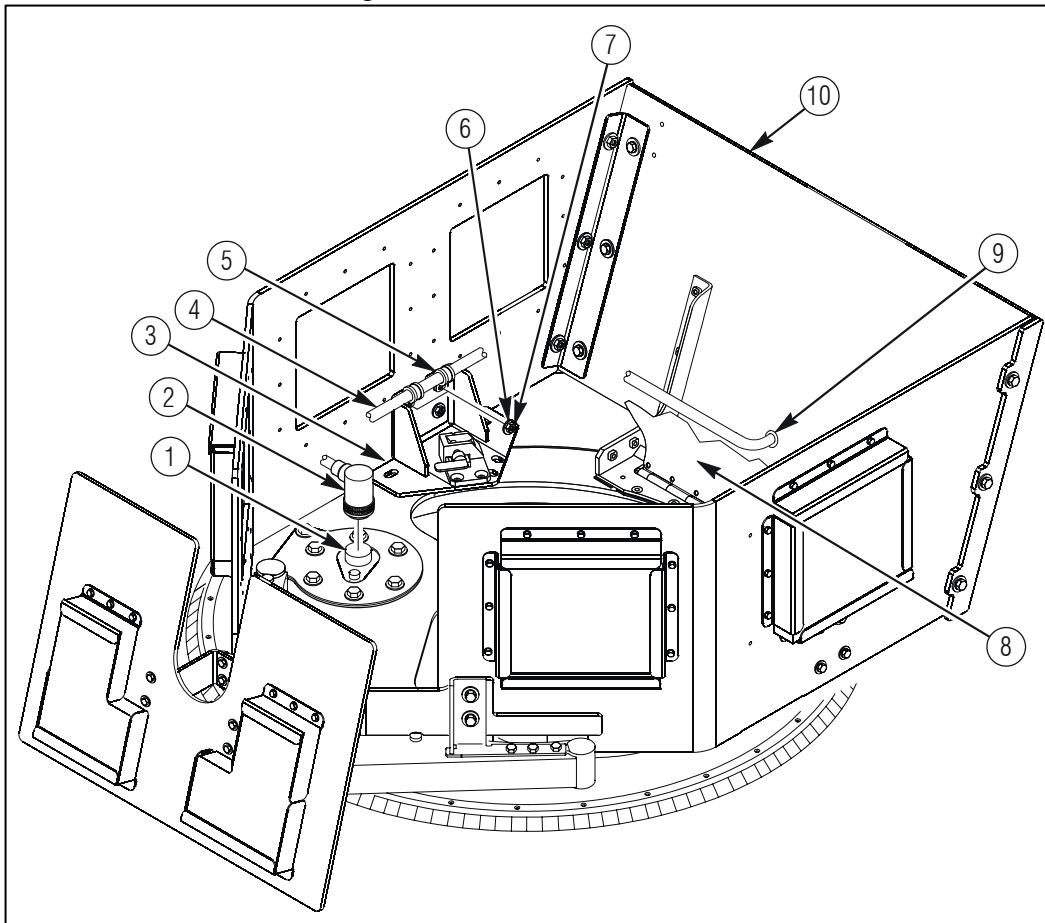


Figure 38

17. Secure loop clamp (7) to B-beam panel (6) with 4397000-006 capscrew (2), two 4397005-010 washers (1), and 4397064-001 locknut (8) as shown in figure 38 (pg.35). Tighten locknut (8) to 10 lb-ft. (14 N·m).

I. Install wire harness from system control box assembly to external batteries as follows:

1. Connect 6432531-01M1 wire harness connector (2) to system control box assembly connector (1) as shown in figure 39.



*Figure 39*

2. Remove locknut (7) and washer (6) from side bracket (3) as shown in figure 39. Discard locknuts (7).
3. Install 6432788-01M1 loop clamps (5) on 6432531-01M1 wire harness (4) as shown in figure 39.
4. Secure loop clamps (5) to side bracket (3) with existing washers (6) and 4397064-005 locknuts (7) as shown in figure 39. Tighten locknut (7) to 37 lb-ft. (50 N·m).
5. Do not connect 6432531-01M1 wire harness (4) to external batteries at this time.

J. Install joystick assembly and wire harness as follows:

1. Connect 6432535-01M1 wire harness (16) to 6432528-01M1 or 6432528-200M1 joystick assembly (2) and system control box assembly connector (14) as shown in figure 40.

**NOTE**

Joystick assembly is equipped with magnets in the base for easy mounting on steel surfaces.

2. Mount joystick assembly (2) on either side panel (1 or 15) of the gunner protection kit. Refer to figure 40.

**CAUTION**

ENSURE EMERGENCY STOP SWITCH (3), ON SYSTEM CONTROL BOX ASSEMBLY (4) IS IN THE **OFF** (IN) POSITION. REFER TO FIGURE 40.

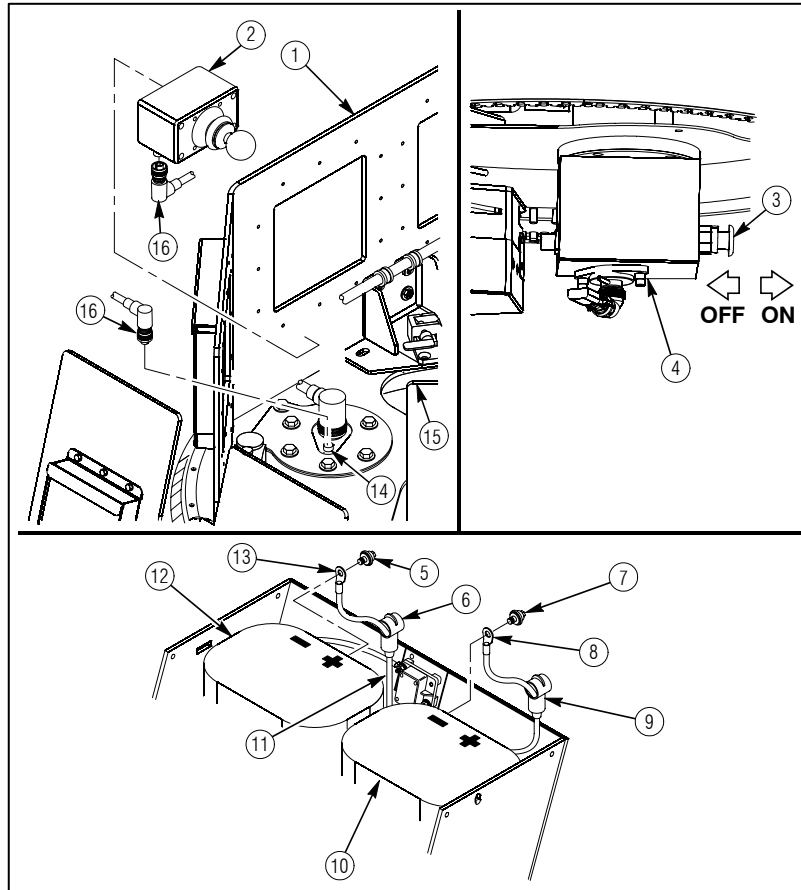


Figure 40

3. Attach front of right armor panel (5) and 13014404 wire cover (14) to right front bracket (13) using two existing hex bolts (15), two 4397004-008 lockwashers (16), four existing washers (17) and two 4397064-005 locknuts (18) as shown in **SECTION 1** figure 12 (pg.12). Tighten hex bolts (15) to 37 lb-ft (50 N·m).
4. Use existing hardware (19) to attach wire cover to turret access cover as shown in figure **SECTION 1** 12 (pg.12). Tighten hex bolts (19) to 37 lb-ft (50 N·m).

K. Connect wire harness to external batteries as follows:

1. Connect red wire connector (13) of 6432531-01M1 wire harness (11) to POSITIVE (+) terminal of battery (12) with 6432546-01M1 battery terminal bolt (5) as shown in figure 40. Tighten battery terminal bolt (5) to 70 lb-in. (8 N·m) and slide boot (6) over connection.

2. Connect black wire connector (8) of 6432531-01M1 wire harness (11) to NEGATIVE (-) terminal of battery (10) with 6432546-01M1 battery terminal bolt (7) as shown in figure 40 (pg.37). Tighten battery terminal bolt (7) to 70 lb-in. (8 N·m) and slide boot (9) over connection.

L. Install battery hold down strap and battery box top assembly as follows:

1. Slide 6432862-01M1 or 6432862-200M1 battery hold-down strap assembly (5) through slot in battery box assembly (4) and secure opposite end with one 4397000-034 capscrew (6), two 4397005-012 washers (3), and one 4397064-003 locknut (2) as shown in figure 41. Tighten locknut (2) to 21 lb-ft (28 N·m).
2. Install 6435453-01M1 or 6435453-200M1 battery box lid assembly (1) on battery box assembly (4) and secure with four 4397000-007 capscrews (8), 4397004-006 lockwashers (7), and 4397005-010 washers (9) as shown in figure 41. Tighten capscrews (8) to 10 lb-ft (14 N·m).

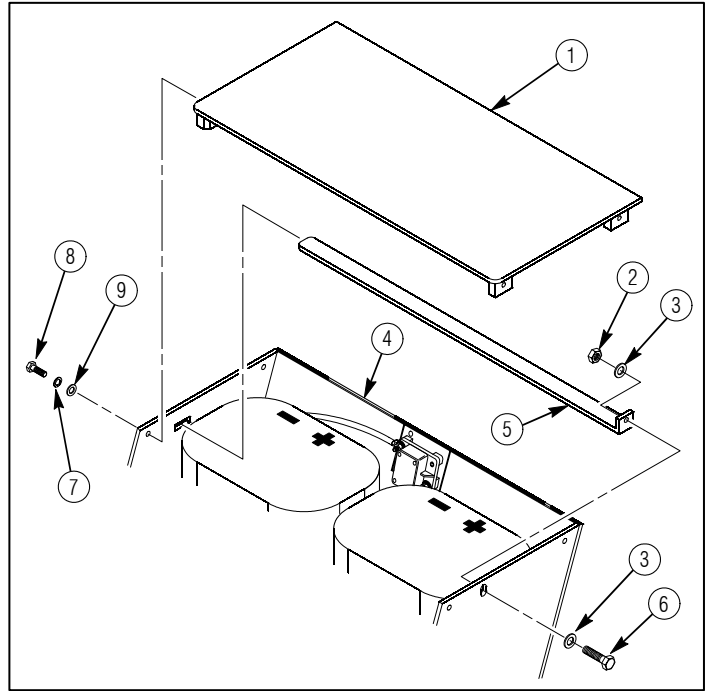


Figure 41

M. Adjust motor and drive assembly to turret stop ring as follows:

### **NOTE**

If necessary, manually rotate turret to locate pintle weapon mount toward front of vehicle..

1. Visually inspect engagement of drive gear (1) into turret stop ring (2) and adjust two bearings (13) to achieve full engagement as shown in figure 42 (pg.39). Tighten four capscrews (14) to 37 lb-ft (50 N·m).
2. Activate motorized traversing unit by moving emergency stop switch (4), on system control box assembly (7), to the ON (OUT) position and move motor engagement control (17) to DRIVE position. Refer to figure 42 (pg.39).

### **NOTE**

Motorized traversing gear system will be noticeably louder in area of hardest engagement of drive gear and turret stop ring

### **CAUTION**

ENSURE ROOF IS CLEAR OF TOOLS, PARTS, PERSONNEL, ETC, AND CARGO HATCH IS CLOSED BEFORE OPERATING TURRET.

3. While rotating turret (15), using joystick assembly (3), listen to the system and determine the area of hardest engagement of drive gear (1) into turret stop ring (2). Stop turret (15) at location of hardest engagement. Refer to figure 42.

### **CAUTION**

TURN OFF BPMTU BEFORE PERFORMING ANY ADJUSTMENTS TO THE MOTOR AND DRIVE ASSEMBLY.

4. Loosen four  
capscrews (14) and  
adjust two bearings  
(13) to achieve full engagement of drive gear (1) into turret stop ring (2). Tighten four  
capscrews (14) to 37 lb-ft (50 N·m). Refer to figure 42.

*Figure 42*

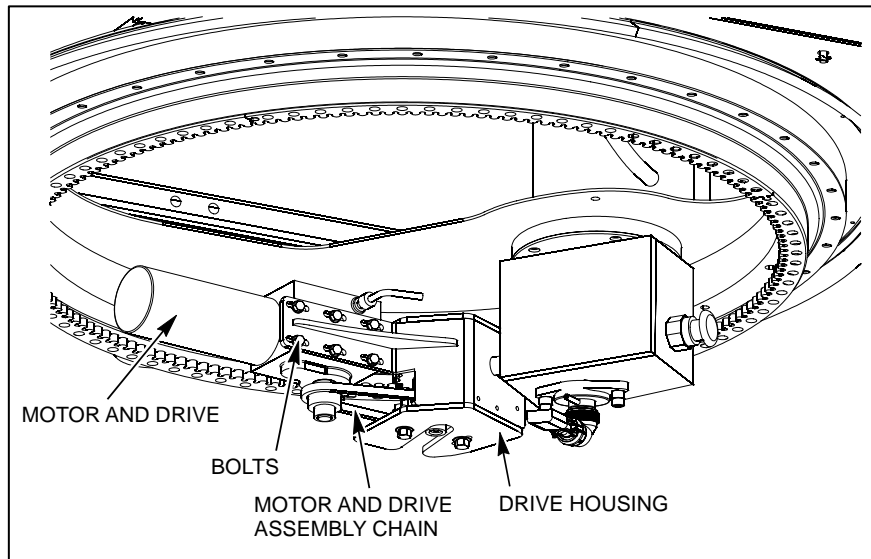
N. Inspection and adjustment of the motor drive assembly chain:

1. Inspect the motor and drive assembly chain for excessive slack. A properly adjusted motor and drive assembly chain has no slack. Refer to figure 43 (pg.40).

### **NOTE**

Ensure motor engagement control is in the NEUTRAL position

2. If necessary, move motor engagement control (6) to NEUTRAL position by pushing in and rotating down. Refer to figure 32 (pg.28).
3. To adjust chain, loosen 6 bolts holding the motor and drive to the drive housing. Use hand to slide motor and drive assembly over until there is no slack in the drive chain. Tighten bolts to 6 lb-ft (8 N·m). Refer to figure 43.



*Figure 43*

O. Complete installation as follows:

1. Install 6437073-01M1 drive housing guard (12) on motor and drive assembly (16) and secure with three 4397000-005 capscrews (9), 4397004-006 lockwashers (11), and 4397005-010 washers (10) as shown in figure 42 (pg.39). Tighten capscrews (9) to 10 lb-ft (14 N·m).
2. Secure excess motor harness assembly to motor assembly with two 6432885-01M1 cable ties. Ensure motor harness assembly does not interfere with any moving parts.

### **NOTE**

If necessary, rotate turret to locate pintle weapon mount toward front of vehicle.

3. Connect break-away connector (8) on system control box assembly (7) to break-away connector (5) on 6432538-01M1 wire harness (6). Refer to figure 42 (pg.39).
4. Store 6435382-01M1 Wire Harness #7 Pigtail to Break Away Connector in a safe place. 6435382-01M1 Wire Harness #7 Pigtail to Break Away Connector is used to allow continuous charging of the BPMTU.
5. Install right rear rifle support (TM 9-2320-387-24-2).
6. Install front turret armor-mounted hatch latch (TM 9-2320-387-24-2).
7. Connect battery ground cables (TM 9-2320-387-24-1).

**LEVEL OF MAINTENANCE:** Unit



### Section 3: Manual Traversing Unit Installation

#### PROCEDURES:

A. Prepare vehicle as follows:

1. Apply vehicle parking brake. (TM 9-2320-387-10.)
2. Open and secure turret weapon station cover. (TM 9-2320-387-10.)

A. Install traversing gear assembly and covers as follows:

1. Remove quick release crank handle (2) from 6434946-01M1 traversing gear assembly (1) by pulling pin assembly (3). Refer to figure 44.
2. Apply 8030-01-025-1692 sealing compound to threads of two 4397000-059 capscrews (16) and one 4397030-120 socket head capscREW (14). Refer to figure 45.
3. Install 4397030-120 socket head capscREW (14) and 4397005-014 washer (15) into center hole in bottom side of turret bearing (1). Leave socket head capscREW (14) out approximately .250 inch to allow installation of traversing gear assembly (18). Refer to figure 45.
4. Install 6434946-01M1 traversing gear assembly (18) onto turret bearing (1) and ensure washer (15) is on bottom side of traversing gear assembly (18). Refer to figure 45.
5. Secure traversing gear assembly (18) to side of turret bearing (1) with two 4397000-059 capscrews (16) and 4397005-014 washers (17) as shown in figure 45. Do not tighten capscrews (16) at this time.

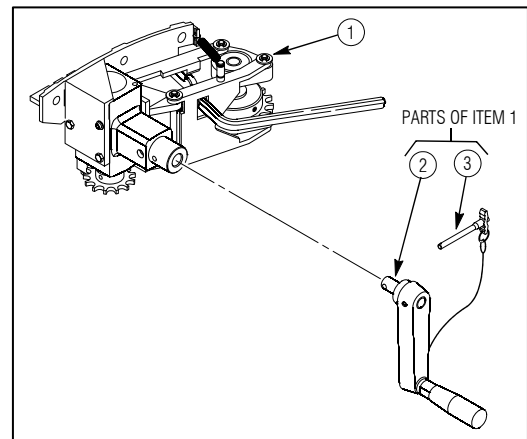


Figure 44

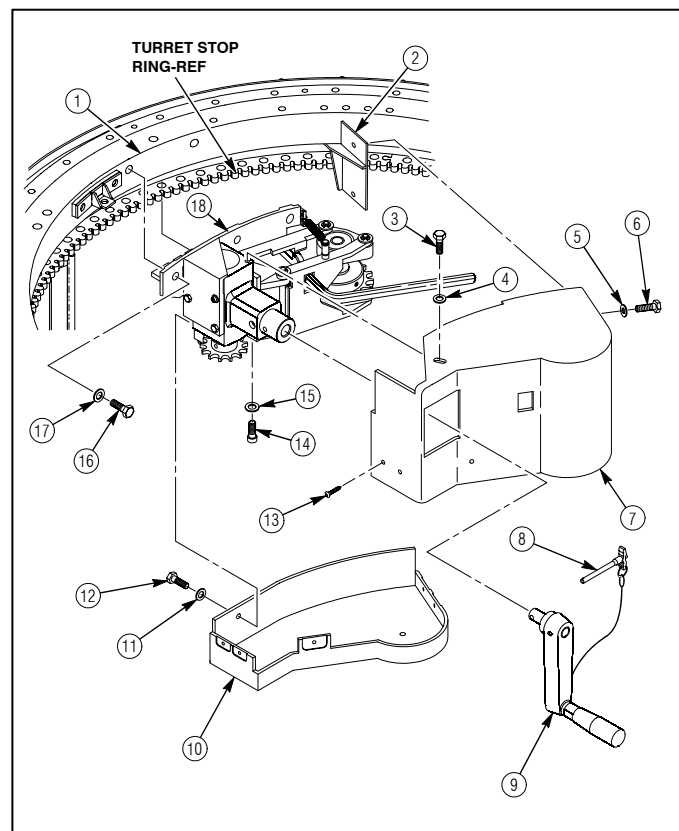


Figure 45

### **NOTE**

In order to tighten socket head capscrew, allen wrench must be inserted through hole in turret stop ring. Rotate turret as required to gain access from below.

6. Tighten socket head capscrew (14) to 37 lb-ft (50 N·m). Refer to figure 45 (pg.41).
  7. Tighten two capscrews (16) to 37 lb-ft (50 N·m). Refer to figure 45 (pg.41).
  8. Apply 8030-01-025-1692 sealing compound to threads of four 4397000-005 capscrews (6, 3 & 12). Refer to figure 45 (pg.41).
  9. Install 4662414-002 traversing upper cover (7) on 4662416-002 front cover bracket (2) with two 4397000-005 capscrews (6) and 4397005-010 washers (5) as shown in figure 45 (pg.41). Do not tighten capscrews (6) at this time.
  10. Install 4662414-002 traversing upper cover (7) on 6434946-01M1 traversing gear assembly (18) with 4397000-005 capscrew (3) and 4397005-010 washer (4) as shown in figure 45 (pg.41). Do not tighten capscrew (3) at this time.
  11. Install 4662418-002 traversing lower cover (10) with five 4397054-032 screws (13) as shown in figure 45 (pg.41). Do not tighten screws (13) at this time.
  12. Install 4662418-002 traversing lower cover (10) to 6434946-01M1 traversing gear assembly (18) with 4397000-005 capscrew (12) and 4397005-010 washer (11) as shown in figure 45 (pg.41).
  13. Tighten five screws (13). Refer to figure 45 (pg.41).
  14. Tighten two capscrews (6) and capscrew (12) to 10 lb-ft (14 N·m). Refer to figure 45 (pg.41).
  15. Tighten capscrew (3) to 30 lb-in. (3 N·m). Refer to figure 45 (pg.41).
  16. Install quick release crank handle assembly (9) on traversing gear assembly (18) and secure with pin assembly (8). Refer to figure 45 (pg.41).
- B. Install quick release crank handle assembly storage pouch as follows:

### **NOTE**

The following procedure requires the vehicle to be equipped with a gunner protection kit (GPK).

1. Layout and mark a 6 X 10.5 inch area on left side plate (1) of GPK as shown in figure 46.
2. Clean marked area on left side plate (1) with 6810-00-127-4532 ethyl alcohol and let dry. Refer to figure 46.
3. Spray marked area on left side plate (1) with 8040-00-938-6860 adhesive primer. Refer to figure 46.
4. Cut three 10.5 inch long pieces of 6431468-05M1 Velcro hook.
5. Remove protective backing from three 10.5 inch long pieces of 6431468-05M1 Velcro hook (2) and install in marked area on left side plate (1) as shown in figure 46.
6. Install 6435128-01M1 pouch (3) onto Velcro hook (2) and press firmly. Refer to figure 46.

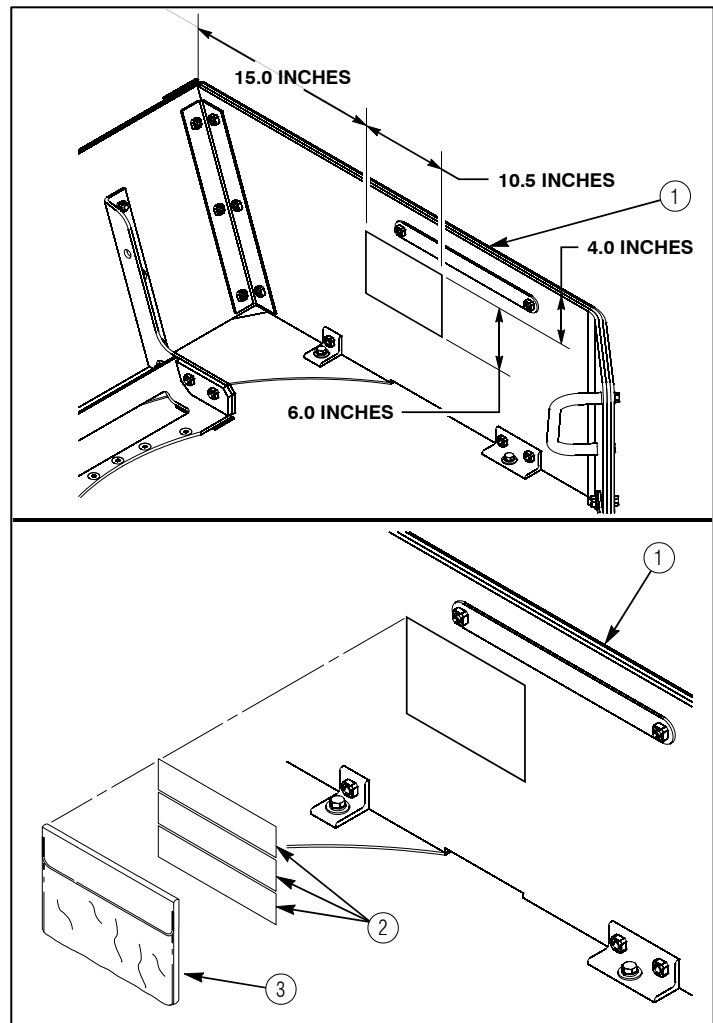


Figure 46

D. Close and secure turret weapon station cover. (TM 9-2320-387-10.)

**LEVEL OF MAINTENANCE:** Unit

# *Appendix A*

## *Appendix A*

Listing of **TECHNICAL MANUAL REFERENCES** used in this digest article:

REFERENCE IN THIS DOCUMENT ON PAGE	TECHNICAL MANUAL REFERENCED FROM	TECHNICAL MANUAL PARAGAPH AND HEADING
22	TM 9-2320-387-10	2-14. STOPPING THE VEHICLE AND ENGINE
22	TM 9-2320-387-10	2-17. COMPANION SEAT ASSEMBLY AND BATTERY BOX COVER REPLACEMENT
23	TM 9-2320-387-24-2	11-55.1. TURRET BRAKE ASSEMBLY REPLACEMENT
23	TM 9-2320-387-24-1	4-68. BATTERY CABLE MAINTENANCE
23	TM 9-2320-387-24-2	11-50. TURRET ARMOR AND TURRET BEARING HATCH LATCH REPLACEMENT
25	TM 9-2320-387-24-2	11-66. RIFLE SUPPORT MAINTENANCE
40	TM 9-2320-387-24-2	11-66. RIFLE SUPPORT MAINTENANCE
40	TM 9-2320-387-24-2	11-50. TURRET ARMOR AND TURRET BEARING HATCH LATCH REPLACEMENT
40	TM 9-2320-387-24-1	4-68. BATTERY CABLE MAINTENANCE
41	TM 9-2320-387-10	2-14. STOPPING THE VEHICLE AND ENGINE
41	TM 9-2320-387-10	2-33. UP-ARMORED WEAPON STATION OPERATION
43	TM 9-2320-387-10	2-33. UP-ARMORED WEAPON STATION OPERATION

END OF DOCUMENT